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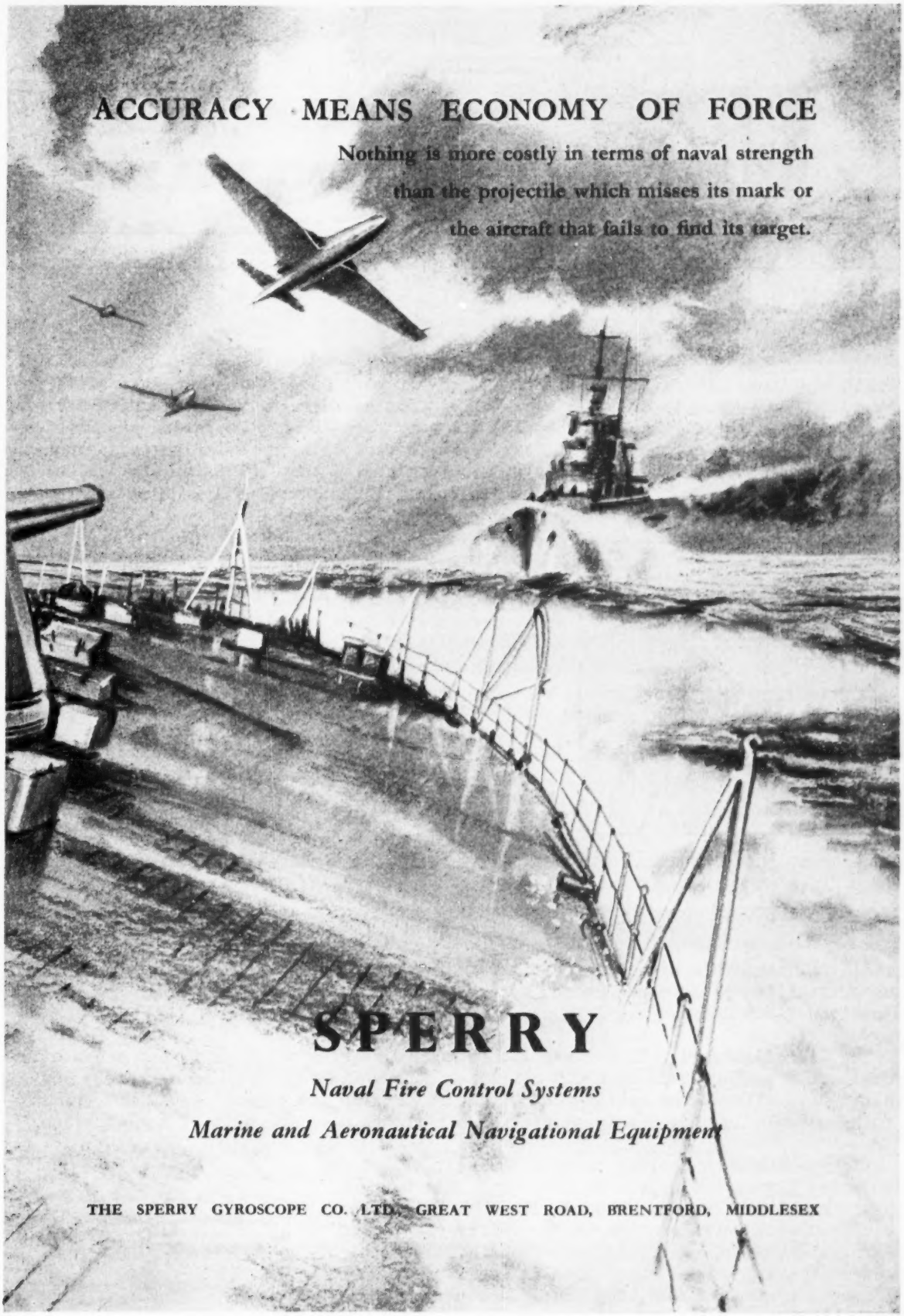
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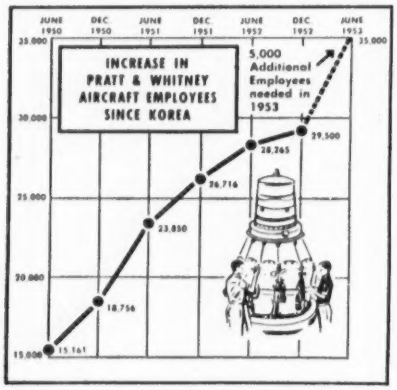
## PRATT & WHITNEY AIRCRAFT HIRES 30,000TH EMPLOYEE

Pratt & Whitney Aircraft division of United Aircraft Corporation recently hired its 30,000th employee. In a little over two and one half years, since the outbreak of war in Korea, the division has doubled its work force to meet expanded aircraft engine requirements of the U.S. military services and civilian aviation throughout the free world. Increasing production of such engines as the J-57 turbojet, the world's most powerful aircraft power plant being built in quantity, will require the division to add another 5,000 workers to its payroll this year.




Since mid-1950 Pratt & Whitney's factory area also had doubled. Space devoted to manufacturing now totals 4,000,000 square feet in four plants. This space does not include extensive research and development facilities, nor does it include a variety of other engineering, test, and service structures.

Approximately 50 per cent of the total horsepower to be produced by Pratt & Whitney Aircraft will be jet in 1953. The T-34 turboprop and ramjet engine programs are moving ahead, and deliveries of piston engines will be increased during the year.

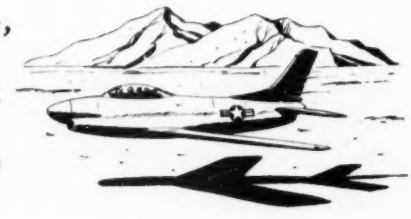
Meanwhile it has been revealed that the company's investment in facilities for its extensive experiment and development work is now four times as much as it was at the end of World War II.

## HAMILTON STANDARD PRODUCTS MEET SEVERE TESTS

Hamilton Standard's air cycle refrigeration unit in recent weeks contributed to an outstanding performance record by one of America's top jet fighters, the North American F-86D Sabre.

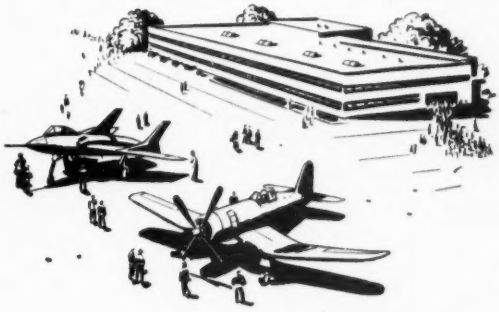
The Sabre, equipped with the Hamilton Standard refrigeration unit, set a new official world speed record of 698.5 miles per hour while flying at an extremely low altitude. Without the cooling unit, temperatures in the cockpit would have risen to unbearable levels largely because of air friction on the skin of the airplane.

High-performance cooling units are essential, since, in a jet flying 600 m.p.h. at sea level, the temperature could rise to 190 ° Fahrenheit in a cockpit not equipped with refrigeration units. Fifty per cent of this heat would be generated by air friction on the aircraft skin, 40 per cent by solar radiation, and 10 per cent by the pilot's body heat and other causes.



## PUBLIC INSPECTS CHANCE VOUGHT AIRCRAFT FACTORY

Chance Vought Aircraft opened certain sections of its plant in Dallas, Texas, for public inspection on two days in February. Crowds estimated at more than 50,000 persons attended the two-day "open house," the first Chance Vought has had since this division of United Aircraft Corporation moved to Dallas five years ago.



The event marked the end of production of the famed Chance Vought F4U Corsair fighter planes -- the end of piston-engine fighter aircraft production in the United States -- and the beginning of an all-jet era for the division. The twin-jet, swept-wing F7U-3 Cutlass fighter is now being built for the U.S. Navy.

While new Corsairs will no longer be made, the life of these famed fighter airplanes is far from ended. Seven versions of the airplane including a new heavily armored, heavily armed type designed for ground attack missions, are now in active combat use in Korea. The last group of production Corsairs, designated the F4U-7, were manufactured for the French Navy under the Mutual Defense Assistance Program.

During World War II more than 12,000 Corsairs were built. They destroyed 11 enemy aircraft for each of their own kind lost in air combat. By the end of World War II the gull-winged fighters had fought from the Solomon Islands to the Indian Ocean, from the South China Sea to Norway. They were flown by the U.S. Navy and Marine Corps, by the British, and by the New Zealand Air Force.

## SIKORSKY HELICOPTERS SERVE FLOOD VICTIMS, BEGIN FREIGHT SERVICE

In flood-stricken Holland and England, helicopters recently flew from dawn to dusk for days evacuating flood victims and bringing in food, medicines and other supplies to survivors. Thousands of lives were saved by helicopters from American, British and Dutch military units. Taking part were big Sikorsky S-55s from U.S. Air Force units, Dutch S-51s, R.A.F. S-51s and U.S. Army Bell H-13s.

In the United States, big Sikorsky S-55 helicopters are now being flown by New York Airways, Inc. in freight transfer service between LaGuardia, Idlewild and Newark airports in the New York City area. Currently, only air freight from airlines is being carried. However, public air freight service is expected to begin soon. In the operation, freight moving through the New York area can be enormously speeded. For example, four hours is required for surface travel freight between Idlewild International airport, on Long Island, and the Newark airport in New Jersey. But by S-55 helicopters, the transfer between the two points can be made in only 18 minutes.

The new service inaugurated the world's first regularly scheduled civilian helicopter freight operation. Meanwhile, other air carriers, such as the pioneering Los Angeles Airways, Inc., are also expected to institute helifreight services in addition to air mail work. The Los Angeles firm uses both Sikorsky S-55s and S-51s but the big S-55s would be used for air freight hauls.

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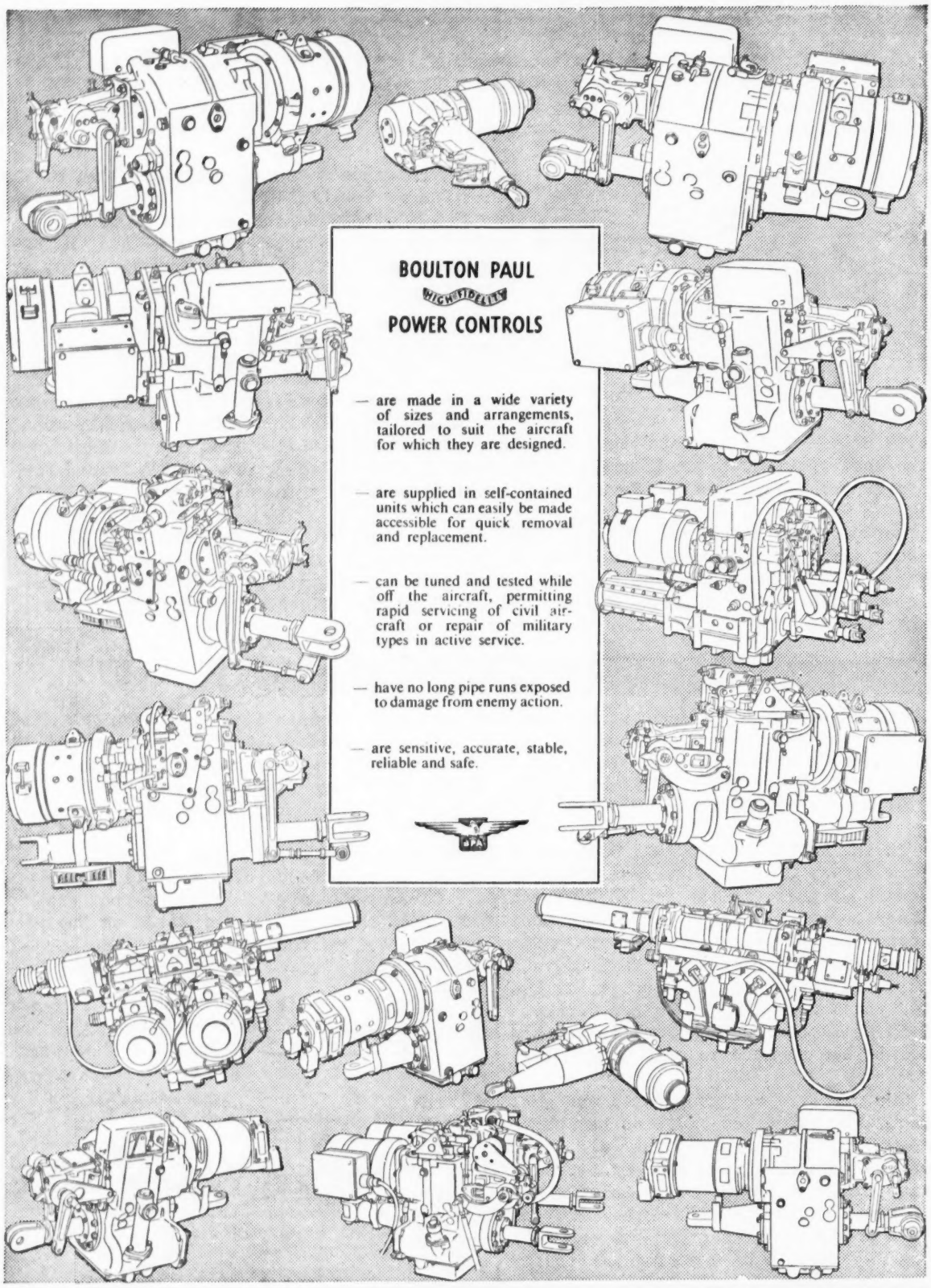
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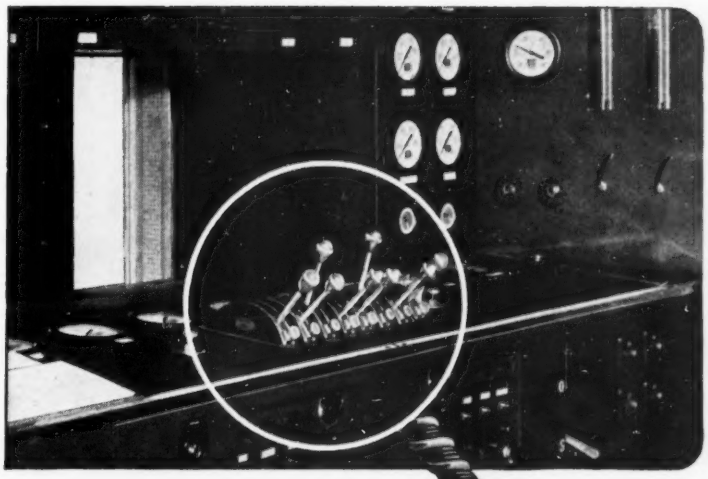

*Control Desk of new test-houses at Armstrong Siddeley Motors*

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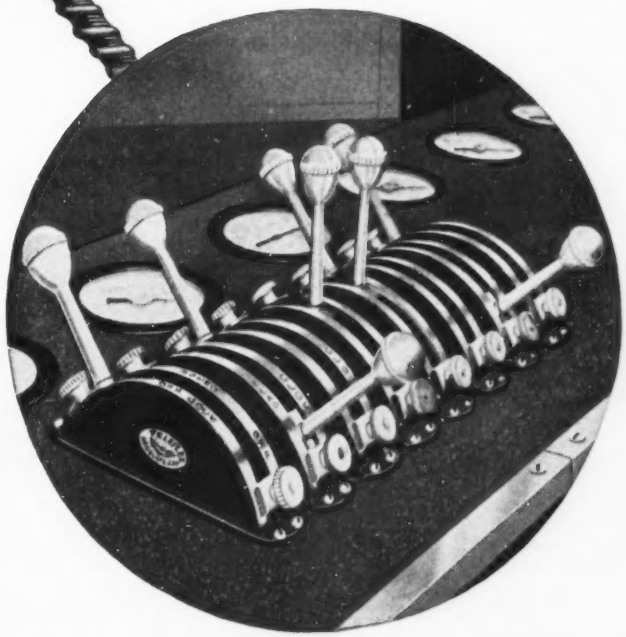

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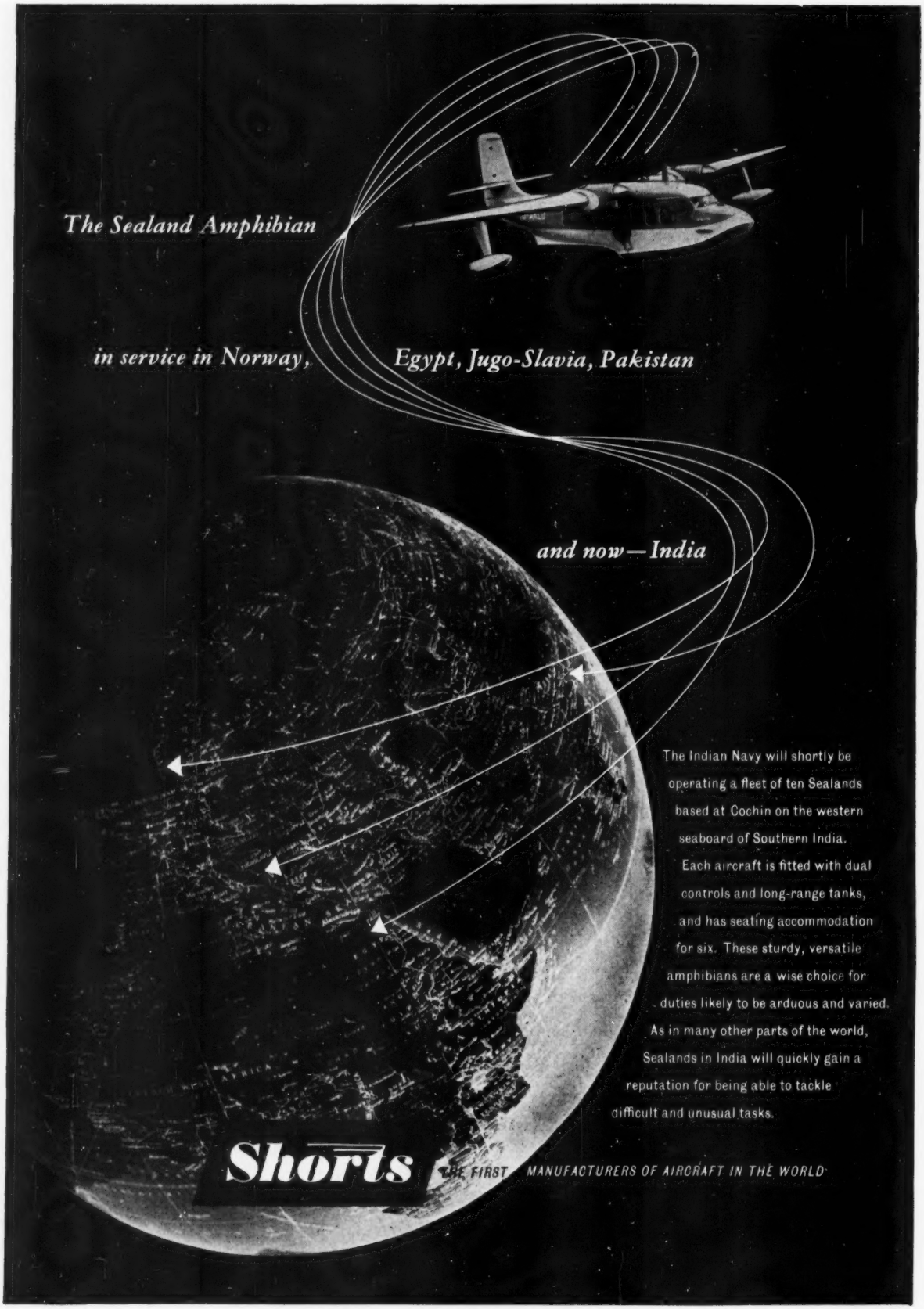
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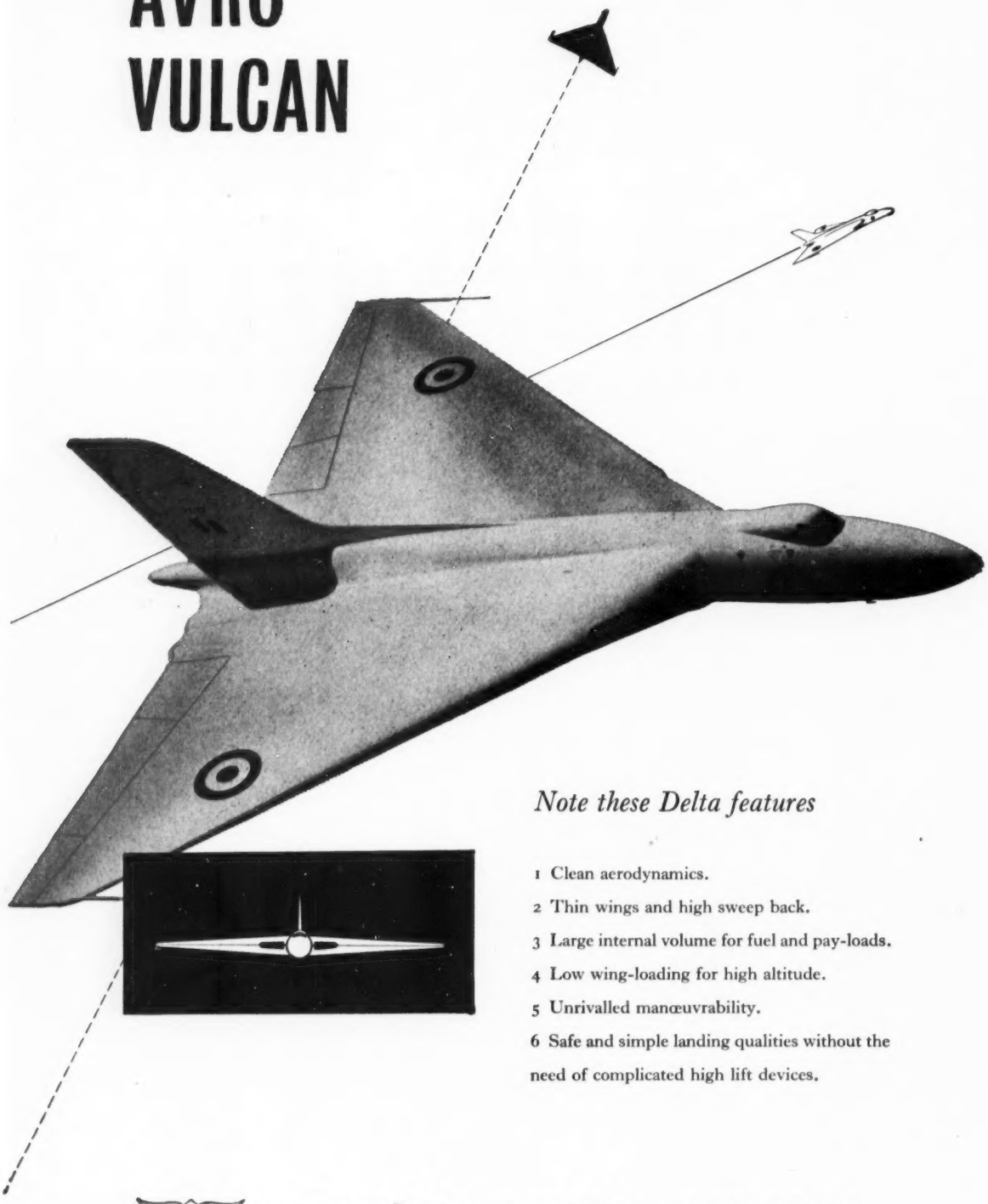

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IN THIS ISSUE:

Review Curtain-Raiser - 768
The Sharp End - - - - 773
A.S.T. Developments - - 778
Happy Rally - - - - 780
Royal Naval Review Fly-past - - - - - - 782
Fifty Years of Flying - - 788
Belgrade Journey - - - 789
The Skylark at Lasham - 790

## Procuring Naval Aircraft

A BULKY document recently published by H.M. Stationery Office is entitled *Seventh Report from the Select Committee on Estimates*. Having glanced at its 200 pages of close-printed type, most busy people might, with justification, pass over this report; yet there is much of general interest about the industry to be learned from it, and some details of special note as well. It is only committees such as this that are in a position to question men like Sir John Boothman, Controller of Supplies (Air), and Sir Frederick Handley Page, on details of aircraft, Service requirements, ordering procedure and deliveries.

To those in the aircraft industry who are closely concerned with military contracts the report reveals something of the old, old story, yet at the same time the close questioning brings out the endeavours which are made to assess well in advance the aircraft requirements of the Navy, to keep those requirements up to date without causing production delays, and to incorporate, with advantage, equipment in line with the latest technical developments.

That the efforts of those concerned have not succeeded in full must be admitted, but this week's splendid assembly of ships and aircraft for Her Majesty's Royal Review (see centre pages) left no doubt that the Navy has much fine equipment in service; nor is there any doubt as to the ability of British sailors to make the best use of it.

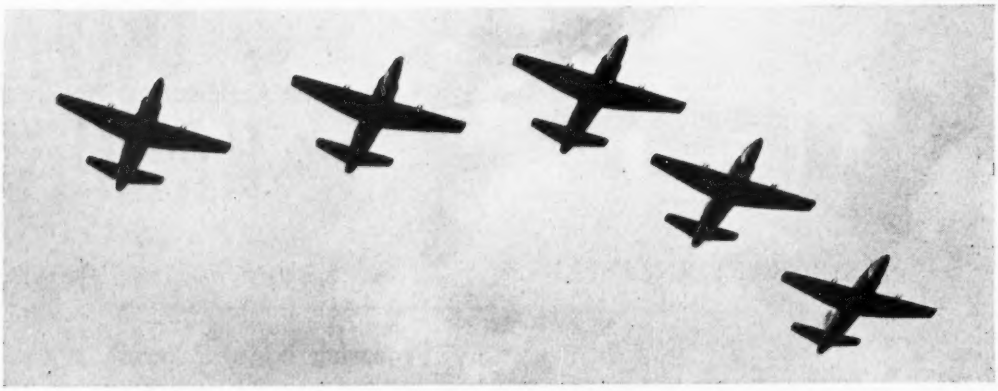
On the whole, the Navy, as today, has always tended to be short of modern aircraft; but the Committee's candid report does not bring out discreditable details about the people concerned with aircraft procurement. It does, however, underline once again the importance of settling a specification, freezing the design as soon as possible, and then leaving the company to get on with the production. In addition, one sees the advantage of taking reasonable risks: of ordering off the drawing-board and—in the case of a few very important specifications—of continuing to order more than one make of prototype as insurance, even though the additional cost may run into millions of pounds. Apparently the Admiralty is now prepared to order without waiting, as in the past, to see the prototype fly. As a result, the time which will elapse between drawing-board and production should be about five years and certainly not more than seven.

On page 796 we summarize the part of the Select Committee's report concerned with the Navy's newest equipment—the Wyvern, Sea Hawk and Gannet. Broadly speaking, these machines are not yet in full service, for three separate reasons described by Mr. Ralph Glyn, the chairman, as technical for the Wyvern, production for the Sea Hawk, and as date of specification in the case of the Gannet.

Recollection of the month-by-month news *Flight* has given of these aircraft, and examination of the document here discussed, makes it clear that the incorporation of the Python turboprop (after Eagle and Clyde) in a machine of such advanced conception as the Wyvern presented some very difficult technical problems for solution. The Sea Hawk has undoubtedly been delayed not only by production arrangements but by the late placing of the order. The Gannet is now a very different machine from that originally prescribed in the specification G.R. 17/45, and it is hardly fair to talk of eight years to production when the design was still fluid two years ago. In view of the great increase in weight the attainment of the desired performance from this aircraft may now depend upon the engine manufacturer's ability to find even more power.

The Navy still has no aircraft in the fighter category which can do better than match the performance of foreign contemporaries. We note, however, that a new fighter has been ordered—before it has flown—and indications are that this is the swept-wing Supermarine 508, which, according to (this time) Spanish sources, is to be known as the 515. In addition, reference is made to a de Havilland design to follow the Sea Hornet and Venom. In view of *Flight's* suggestion of many months ago regarding the D.H. 110 and the fact that this already well-developed aircraft is at present undergoing further flight development, we are wondering if the Navy may not, after all, have decided that a bird on the wing will come to hand before one on paper. A way seems to be open for a swept-wing sonic aircraft to be in Fleet Air Arm service within two or three years.

"FLIGHT" photographs



*A purposeful formation of Attacker F.B. Mk. 2s with which 803 Squadron has now been re-equipped.*

# REVIEW CURTAIN-RAISER

## *The Lee-on-Solent Display: a Ride in the Fly-past Rehearsal*

ARRIVING last Saturday at Royal Naval Air Station Lee-on-Solent (H.M.S. *Daedalus* to the initiated) in, for once, very fair weather, we were greeted by the astonishing sight of approximately 130 Naval aircraft lined up, with wings folded, on the nearest runway. Three lines of them there were—packing the runway as though parked on the flight-deck of some enormous carrier. Round the perimeter of the field were another 70 or so.

The flying display, somewhat curtailed this year because of the fly-past practice, began with a polished display by three helicopters, an S-55, an S-51, and a Hiller. The largest machine exhibited remarkable agility, and made a dummy auto-rotative descent from three or four hundred feet, opening up at the last minute and climbing steeply away; the S-51, "owned" by 705 Squadron, winched-up a volunteer from the ground; whilst the Hiller displayed a notable partiality for moving sideways like some overgrown crab. As the last the of helicopters sank to the ground, the scream of jets penetrated from the north, and a moment later five Attackers of 803 Squadron, led by Lt. Cdr. MacDonald, swept over the crowd, leading by way of a loop into a fine exhibition of formation aerobatics. The five seemed veritably linked by cords, as at Hendon of old—but a feature was a change of formation atop a loop.

Next came individual displays by a number of aircraft. First a Swordfish, most famous Naval aircraft of all time, showing us what flying used to be : then a Gannet, doing a Jekyll and Hyde with the two halves of its Double Mamba; thirdly, a Wyvern—the air was rent with formidable noise as this characteristic shape sped by : and lastly a Sea Hawk of 806 Squadron, diving out of a bright sky and subsequently looping and rolling with disdainful ease. One roll was undertaken notably low over the runway, and certainly the whole display left one in no doubt that the off-shore contract for these aircraft is a worthwhile thing.

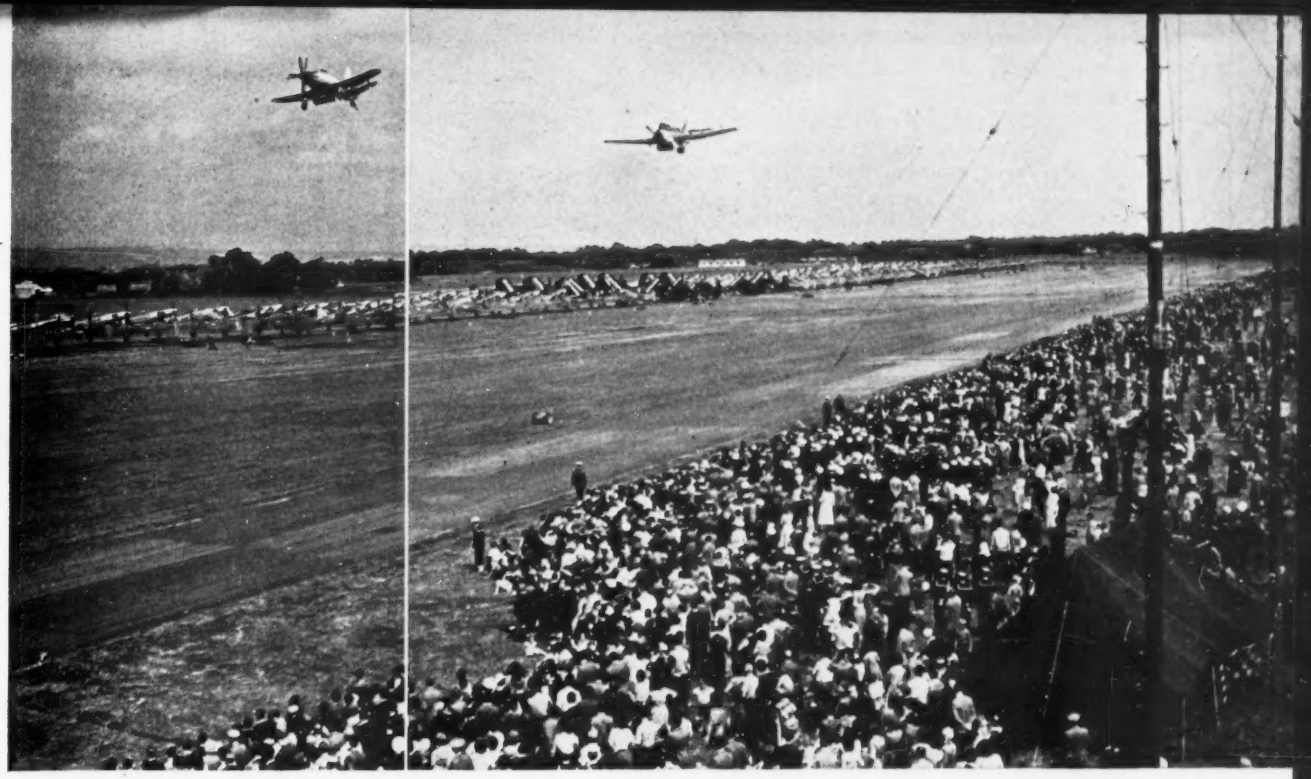
Following the Sea Hawk came an unannounced arrival—four Sea Venoms in formation, rapidly identifiable by their tip-tanks, sweeping low over the crowd in a surprise salute. And then the shriek of jet fighters gave way to impressive silence as Lt. Cdr. Goodhart, who had been towed up to some 2,000ft above the airfield, gave a most graceful and skilful display in an Olympia sailplane. Stall-turns, spins, loops, they were all there; and he landed smoothly at the end of as tight a turn as you could hope to see.

Next all ears cocked skywards, awaiting a sonic bang from an R.C.A.F. Sabre that was appearing, as it were, as guest artist : "45 seconds to go," said the commentator, and right on the dot came a splendid triple explosion. In a few seconds the Sabre flashed into view over the hangars and ran through an exhilarating routine of high-speed aerobatics, in which its astonishing rate-of-roll was particularly noticeable.

After this the crowd was allowed to regain its breath whilst two Naval officers in Harvards put on an instructor-and-pupil act, the commentator expressing the customary appropriate misgivings. Finally, the helicopters reappeared; but this time the S-55 seemed to be filled with policemen answering a 999 call; the Hiller darted about like a bee looking for nectar that was no longer there; and high overhead the S-51 formated on another of the same breed. This was an unlikely sight in itself, but a moment later there was a further rustle of excitement from the spectators, as a figure was seen to jump from the leading machine. A parachute unfurled, and there was Major T. Willans floating gently to an exemplary landing.

The end of the show, however, was by no means the end of aerial activity for the day, for the vast crowd were then able to watch the 200 or so aircraft present take-off at eight to ten second intervals for their last fly-past practice. The writer found himself

*Sea Venoms are now being delivered to the Fleet Air Arm. (Below, left) Anglo-American co-operation has provided the Navy with three types of helicopter (l. to r.): the S-55, the S-51 and the Hiller. (Right) As game as ever—the well-loved Fairey "Stringbag."*



*Long-awaited and very welcome newcomers to Naval service are the turboprop types shown in this composite picture. On the right is the Gannet, on the left the Wyvern. Parked on the runway are aircraft assembled for the Royal Review fly-past.*

favoured with the rear seat of an Avenger of 881 Squadron, R.C.N.—which squadron has been over here for a short Coronation visit. Perched on this vantage-point, one could see all the other aircraft on the runway getting ready to taxi out—and by winding a little handle could rotate the seat into the rear-facing position and examine the three Gannets, the only aircraft due to follow us from Lee.

The big Wright R-2600 was started well in advance of the engines of the Hornets and Furies discernible ahead, as these Cyclones take a long time to gain the required oil temperature: eventually the gauge registered the required figure for the run-up. Shortly afterwards, the folded wings swung down into place, a horn making the air hideous until the locks were in place. We taxied away, waved on by the white-clad ground crew, and behind came the three Gannets, squat and purposeful on their tricycle undercarriages.

Soon we were in position to take-off, then thundering along the runway behind the other aircraft that were already tucking up their wheels and turning away to starboard. Our mount wallowed a little, as Avengers do, in the blended slipstream from ahead—and then we were well clear, catching up to gain loose formation. Ahead blazed the undying flame from the waste-gas chimney at the Fawley refinery, whilst to our left the Fleet stretched out, row upon row of vessels into the distance.

We turned north, and for forty minutes paraded up and down a stretch of country running inland from Southampton. Formation was two flights of four in vic, and at the turns the whole squadron slid into line astern with a curious concertina-like motion: ahead could be seen the Avengers of 815 Squadron of the Royal Navy, whilst behind lurked another Canadian aircraft, fussily taking photographs. Occasionally other machines would briefly enter the field of view: the three Gannets, one of them apparently having bother with its nosewheel door; a lone Vampire; a group of five unidentifiable shapes. And then, suddenly, there was the main stream of the fly-past moving southwards on our left. We increased our speed from 150 kt to just over 200—a bit much for the old Avenger—and the whole squadron turned left and tacked onto the tail of the stream.

Down we came, from 2,000ft to about 600: ahead was the Fawley flame, like a beacon, and beyond and to the left Calshot, with the cocooned Princess on the shore dwarfing the Sunderlands in the harbour. And then we were over the Fleet—about which a colleague was to write on the day itself; and behind the Gannets one could see the jets coming in, having timed their arrival to perfection.

Thus was the final rehearsal completed, and we went off to stooge a trifle drearily round the Isle of Wight and listen to the clear voice of *Daedalus*'s controller ordering the different squadrons in to land. At last it was our turn, and the Avenger lined up on the sodium flares under now-lowering clouds; shortly afterwards she became one with the earth as the stilty undercarriage smoothly met the concrete of the runway. A little taxying, a raising of wings, a sigh from the engine, and that was that. All was done that could be done in preparation for Monday's great event.

---

## I.C.A.O. AT BRIGHTON

LAST Tuesday, June 16th, the seventh session of the Assembly of the International Civil Aviation Organization—the first full-scale session since 1950—opened at the Royal Pavilion, Brighton, and is likely to continue for another two or three weeks. The president of I.C.A.O.'s council, Dr. Edward Warner, is in the chair, and in the course of the Assembly a new council of 21 members will be elected for a three-year term. Delegates representing 59 member-countries are attending the meeting.

Involving the executive committee and the technical, economic and administrative commissions, the agenda embraces 24 items, many of an intricate nature. Much of the proceedings will be occupied by discussions of finance, arising from such matters as the contributions by member-States; technically, the most important item looks like being the technical commission's discussion of present and future developments. Under this heading will come, *inter alia*, proposals to make wider use of technical panels composed principally of experts from States who have knowledge of specialized aspects of air operation; further encouragement of member-nations to set up their own training organizations to promote world-wide uniformity in standards of instruction and examination in practices and procedures; and the possibility of reducing the frequency of regional air navigation meetings, now that the pattern of international air routes is approaching stability.

Among highly topical subjects to be discussed by the economic commission are charges for airport and navigational facilities.

## ROLLS WESTINGHOUSE AGREEMENT

IT was announced last weekend that Rolls-Royce, Ltd., have signed an agreement with the Westinghouse Corporation of Philadelphia (makers of the J34 and J40) turbojets for "technical co-operation "over a period of ten years.

The Rolls-Royce statement says that the agreement "includes exchange of information in the design, development, and production of gas turbine aero-engines and a limited interchange of personnel, and while not specifically designed as a manufacturing licence agreement, this contingency is covered should it be deemed advantageous in the future."

It is added that the agreement has involved the payment by Westinghouse of an initial capital sum to Rolls-Royce.

# FROM ALL QUARTERS

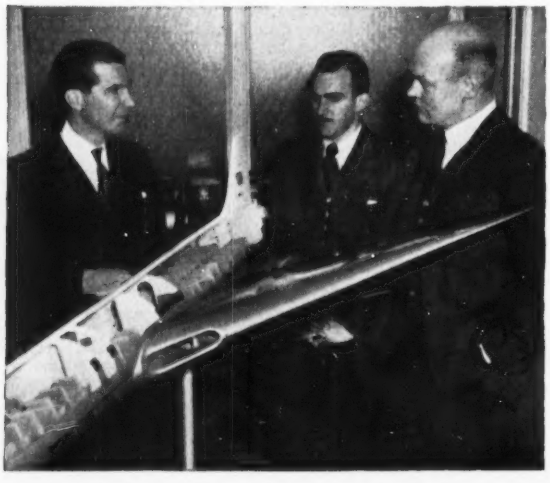
*FLEDGED: WN 339, first production version of the Fairey Gannet, has now emerged—Peter Twiss took it from London Airport to White Waltham—and been delivered to the M.o.S. Modifications include redesigned cockpit hoods, "square" mainwheel doors and modified front oleo leg.*

## Thoughts on Avro's Atlantic

ALTHOUGH most of the available details of Avro's new delta-wing airliner were published in *Flight* last week, a certain amount of fresh information and conjecture has arisen as a result of the Press conference held by Sir Roy Dobson, last Thursday, to announce the project. Sir Miles Thomas, chairman of B.O.A.C., was present on the occasion, as was Mr. Stuart Davies, chief designer to A.V. Roe and Co.

Avro's, said Sir Roy, had started on a preliminary design study of the "inevitable" civil development of the Vulcan as soon as work on the former so permitted—and here was the result, for potential operators to study. The machine was clearly a relation of the Vulcan, and experience with the latter would undoubtedly reduce development time: but a great part of the Atlantic was new, even the wing being different (i.e., larger) than that of the bomber. It would probably take up to three years to get a prototype flying once the word "go" had been given. Power units contemplated at the moment were Olympus turbojets, but a feature of the big delta wing was that almost any power plant could be stowed within it without necessitating serious modification. B.O.A.C.—who, of course, were not in any way committed to the aircraft—had nonetheless made their operating experience available on a generous scale, and this had been very useful indeed in the creation of the new design.

The project was now on the board: the question was, what would happen next? The answer to that was quite simple. Some potential operator, not necessarily B.O.A.C. (although they were in the most advantageous position), must evince sufficient interest in the machine to persuade the Ministry of Supply to finance a prototype. There was no question of Avro's building a prototype as a private venture. Then, as Sir Miles Thomas said, a potential airline customer would need to satisfy himself that the type could do all that it was claimed to do, before placing an order. At least 20 aircraft would need to be ordered before the manufacturer could contemplate production—but Sir Roy Dobson thought that if a major airline ordered any aircraft at all, it would require at least that number, and he personally had no doubt whatever that the performance of the prototype would measure up to its design specification.



*DISCUSSING THE ATLANTIC are, left to right, Mr. J. A. R. Kay (director), Mr. C. Monk (project engineer) and Mr. J. R. Ewans (chief aerodynamicist). This 1/24 scale model—built by Avro craftsmen—shows the basic 94-seat layout, which provides for rearward-facing seats.*

Turning now from the Press conference to theories about the future, it would seem that the crucial decision to be made will, in point of fact, almost certainly be that of B.O.A.C.—who, sometime within the next year or so, must decide on a 100-passenger aircraft capable of cruising at approximately Mach 0.9, for introduction into service in 1958 or 1959. It is clear that there are four possible contenders for this honour: the Vickers V.C.7, which will have the economic advantage of having a very-near relative in production (the Vickers 1,000); the Atlantic, the performance of which, in Sir Miles Thomas' estimation, appears to be five-six years ahead of any known American design; the crescent-winged H.P. 97; and de Havillands' successor to the Comet 3, whatever that may be styled. Unofficial price estimates seem slightly in favour of the Atlantic.

The total number of aircraft of this size and cost which may be ordered from all sources is unlikely to be very large, and it seems on the face of it that perhaps only two of these aircraft will be built, even as prototypes. Once the decision to build a prototype has been made, the design chosen will obviously be in the most advantageous position.

But the critical decision—which ought not to be long delayed—as to which design (or designs) to build at all, is likely to cause the burning of much midnight oil.

## The Royal Tournament

HOW to put aviation "across" within the confines of an indoor arena is the perennial problem of those charged with staging the R.A.F.'s contribution to the Royal Tournament. Last week, at Earls Court, we saw how successfully they had met their responsibility this year, and with what a sympathetic sense of atmosphere the actors told the story of their Service.

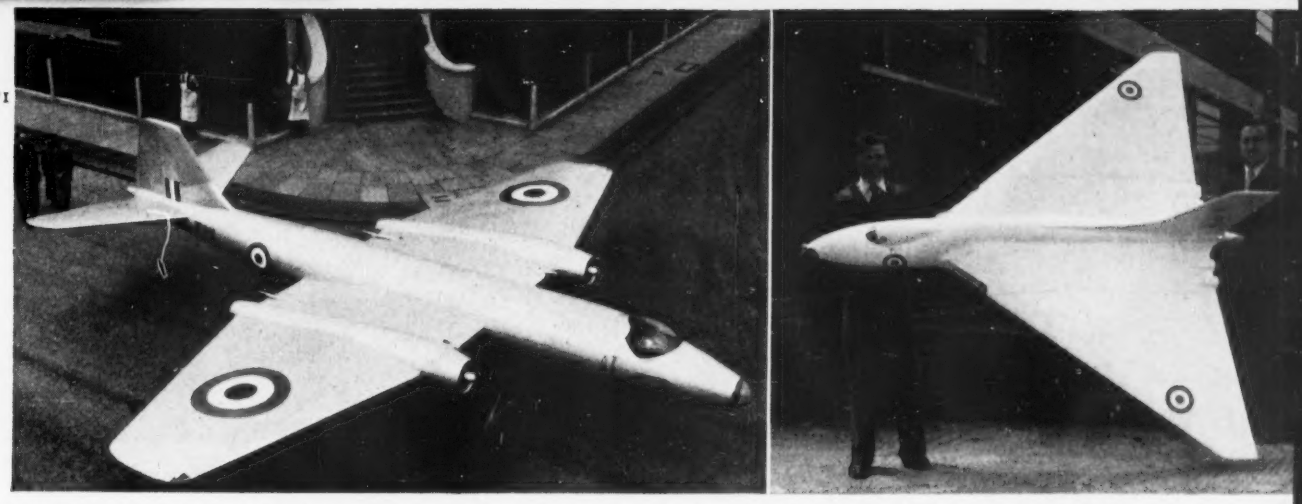
It was not, however, the men and women who were the real stars of the piece: these were the Bleriot monoplane (loaned by the Shuttleworth Trust), the Sopwith Camel and Bristol Fighter (property of the Imperial War Museum), the Hurricane and a full-scale mock-up of the Fairey F.D.1 delta-wing research aircraft.

The declared object of the display was to illustrate the changing methods of handling aircraft; but it went farther than this. It was at once highly educative in a technical sense (not only in respect of the aircraft themselves, but of the equipment and uniforms of their ground and air crews); it was fully as spectacular as could be hoped for; and, above all—according to the age of the viewer—it stirred the memory or aroused the imagination. If we are not mistaken, many a heart will beat quicker beneath an R.F.C. or R.N.A.S. tie before the Tournament ends on June 27, especially when the Camel makes its bow to the nostalgic strains of *Keep the Home Fires Burning*.

But why, we found ourselves wondering, did the narrator not inform the assembly that the actual Camel they saw before them had itself destroyed a Zeppelin?

The machines had been refurbished for the occasion, and very dashing they looked; but again we wondered if it was quite proper to repaint the original stained fabric and insignia. Somehow it seemed to us like dyeing the faded Colours of Waterloo. Had other, authentically marked, examples existed, we should have been less regretful.

The air interest of the Tournament is not confined to this "Pageant of Progress in Service Aviation," as it is entitled. We



*SCALED-DOWN FOR PARIS: At first glance suggesting that English Electric have produced a small fighter, this splendid Canberra model of 32ft 7in span has been built for the Paris Show; its ply-covered wooden structure approximates to full-scale practice. For the A. V. Roe stand is the superbly finished Vulcan. Both are by Westway Models, of East Acton, London, one of whose directors, Mr. Ian Walker (ex-100 Sqn. air gunner) is seen on right.*

ourselves saw a Naval Air team well and truly beaten by Devonport in the Field Gun Display (always a sure-fire hit) and in the display by the combined Women's Services the W.R.A.F. and their Central Band more than kept their end up.

Centre-piece of the R.A.F.'s static exhibit is a Meteor N.F.11, hedged in by turbojets of various dates and degrees of finish. The Meteor bears its myriad stencilled inscriptions, including tankage figures, publication of which would be most reprehensible.

## Peter Lawrence

IT is with deep regret that we have to record the death of Peter Lawrence, M.B.E., Gloster test pilot, in an accident while flying one of the three prototype Javelins on June 11th. The crash occurred on a playing-field near Bristol and, in the words of a statement issued by the Gloster Aircraft Co., Ltd., Lawrence died "in heroic circumstances." Pending the disclosure of further information at the inquest, or subsequently, these circumstances are related in the statement, which said that the pilot "had been flying for half an hour when he radioed to his home base, Moreton Valence, that he was in trouble. At this point he was over 20 000ft. If he had baled out then he would have been safe, but he elected to crash-land with minimum damage to the aircraft and homes and people on the ground. He came down in a glide, seeking to avoid built-up areas with houses, and just before landing found himself over playing-fields where teams of boys were playing cricket. He stayed with the aircraft all the way down to 250ft, put it into a straight slow run in, and baled out, using his ejector seat. However, he had waited too long, and he was killed on impact with the ground. The aircraft swept over the heads of the boys and landed in a field, flat. The wings and tail were undamaged on landing."

"Flight" photograph
*P. G. Lawrence, M.B.E.*

Later reports said that voice and photographic recordings had been recovered from the wreckage and should provide valuable additional evidence.

Peter Godfrey Lawrence was 32 years of age. He entered the aircraft industry as a Handley Page apprentice in 1937, and in 1939 joined the Fleet Air Arm, serving in Swordfish squadrons from 1940 to 1942 and in the Naval Service Trials Unit, on test-flying duties, until the end of the war.

He joined Blackburn Aircraft as an experimental test pilot in 1945 and, after taking the E.T.P.S. course, was appointed chief test pilot. His M.B.E. was in recognition of his deck-landing trials of the Firebrand 4. In June of last year he left Brough in order to become an English Electric test pilot, and at the beginning of this year he transferred to Glosters.

His love of flying was not confined to duty hours : he was a great air-racing enthusiast, and from 1948 onwards flew such varied aircraft as Firebrands, an old Blackburn B.2, and a Proctor in the major events; he won the Kemsley Trophy last summer.

Peter Lawrence's flying experience amounted to more than 3,000 hours on over 80 different types of aircraft. We shall remember him as an unassuming type, always good company at party occasions, and with a zest for life which, though never approaching foolhardiness, sometimes led him to make most spectacular flying demonstrations—as when, at the S.B.A.C. Display at Radlett, in 1946, he thoughtfully watched some startling aerobatics by jet pilots, then took off in a Firebrand, complete with torpedo, and proceeded to roll it at low altitude.

Deep sympathy must go to his widow and his friends; and his passing will be a grievous loss not only to Glosters but to British aviation as a whole. Test pilots of such calibre can ill be spared.

## Provost Progress

A NUMBER of Percival Provost 1 trainers have now been delivered to Flying Training Command of the Royal Air Force, and in the first place they are being subjected—mainly at Little Rissington—to intensive flying trials prior to delivery to F.T.Ss. At least one of the Provosts has already achieved what is probably the highest utilization recorded by any aircraft. In eleven flying days from May 29th it completed 200 hours—an average of 20 hours a day—and at the time of writing the trials are continuing.

A Provost kept by the manufacturers for T.I. work is now being fitted with dive brakes for testing in anticipation of such a requirement on the jet Provost The jet Provost prototype itself, which heads a small initial order, will probably fly for the first time next December or January, an A. S. Viper providing the power.

## Air Ceylon and the Comets

THREE reasons are given for Air Ceylon's decision to suspend—from the end of September—their international services, including the weekly DC-4 flight between Colombo and London. In the first place, the services have involved the operators in heavy losses, estimated at £77,000 for the current financial year alone; there are signs that potential traffic will also be inadequate; and the Skymasters cannot effectively compete against faster aircraft used by other companies—notably B.O.A.C.'s Comets. Air Ceylon's two DC-4s are operated by Australian National Airways.

## This Week-end

LAST week we published a detailed guide to the National Air Races which, organized by Southend-on-Sea Corporation and the Royal Aero Club, are due to take place at Southend Airport tomorrow, June 20th. Essential details are repeated here. Visiting aircraft must land before noon.

There is a total of 36 entries for three events, the Norton-Griffiths Trophy, Grosvenor Cup and Kemsley Trophy, and the first four competitors (of British nationality) successful in each of these contests will be eligible to compete in the fourth race of the day, for the King's Cup. Gates will open at 10.30 a.m., racing will begin at 2.30 p.m.; at 4 p.m. there will be a flying display with Service support, and at 4.50 the King's Cup Race, will be flown; at 5.40 there will be a final display event, and then the prizes.

Admission prices are : cars (any capacity) with occupants, 15s; motorcycle-class vehicles, with occupants, 7s 6d; pedestrians, 2s 6d—children under 12, 1s. For those who still have time to book in advance, there are considerable reductions.

Also being held this Saturday is one of the series of Fleet Air Arm "at homes," this time at Culdrose, near Helston, in Cornwall. A very full flying and "static" programme has been organized, beginning at 2 p.m.

# HERE AND THERE

*EIGHTEEN CANBERRAS photographed near Folkestone during the rehearsal for the Queen's Birthday Fly-past; as related on page 798, the final operation was curtailed by bad weather.*

### French-built Vipers

IT is learned that negotiations have been completed between Armstrong Siddeley Motors, Ltd., and Avions Marcel Dassault for the manufacture, under licence, of the Viper turbojet. There is to be a ceremonial signing and an official announcement at the Paris Show on July 2nd.

### Comet Initiation

THE R.C.A.F.'s first Comet flew from Beirut to London last week in 5 hr 22 min, an average speed of 422 m.p.h. S/L. R. Lloyd, R.C.A.F., was in command of the aircraft, which was completing a 14,000-mile training trip to Colombo and back.

### Second S.A.4 Delivered

THE second prototype of the S.A.4 (four Avons) has been delivered by Short Brothers and Harland, Ltd., to the Ministry of Supply. The aircraft has carried out successful trials since last August, the system of flying controls in particular proving satisfactory, and it will now be used by the M.o.S. for the development of new and secret equipment.

### Church Stretton's Big Day

A MAJOR flying display in the North this summer will be the Naval Air Day at Church Stretton, near Warrington, on July 25th. Support is being given by the aircraft industry, and present indications are that the machines to be demonstrated by firms' pilots may include the Saro Princess, Vickers-Supermarine Swift, Boulton Paul Sea Balliol, Bristol 173 helicopter, English Electric Canberra, Fairey Gannet, Westland-Sikorsky S-51 and Short Sealand. There will also be a three-hangar static show.

### N.Z. Race Caravanserai

CARAVAN sites will be available at London Airport from October 3rd to 8th, for firms wishing to be represented during the period immediately preceding the start of the London-Christchurch (N.Z.) Air Race. Application should be made to Mr. L. W. Green, Deputy Aerodrome Manager, London Airport.

### Percival Appointment

RECENTLY appointed works manager at the Luton factory of Percival Aircraft, Ltd., is Mr. F. W. Buglass. Previously he had spent some eight years with Boulton Paul Aircraft as production manager, and prior to this he had had 18 years' experience with Blackburns as production engineer and in the drawing office.

### Fokker Share Deal

ACCORDING to reports from The Hague, the Dutch Government will dispose of its shares in the Fokker Aircraft Company to a leading group of bankers within the next few weeks. The Government agreement to loan Fokkers £1½ million for the development of two prototype F-27 Friendship twin-engined transports, which has already been approved by the Second Chamber, is conditional on this sale of stock.

### For Camera Buyers

A SPECIAL issue of the *Amateur Photographer*, to be published on July 1st, will contain a comprehensive guide giving particulars of nearly 200 cameras available on the British market.

### Honours Amendment

THE caption to the portrait of Capt. J. Summers, of Vickers-Armstrongs, in our "Coronation Honours" page last week, should have been followed by the letters "C.B.E.," as correctly given in the list on the same page.

### T-36 Order Cancelled

AS a result of the United States Government budget cut certain aircraft contracts have been cancelled. Among them, we learn, is the order for 227 T-36s to be built by Canadair, Ltd. It has been estimated that the contract was worth some £35 million. Canadian orders for similar aircraft were cancelled at the same time.

### Showing Them How

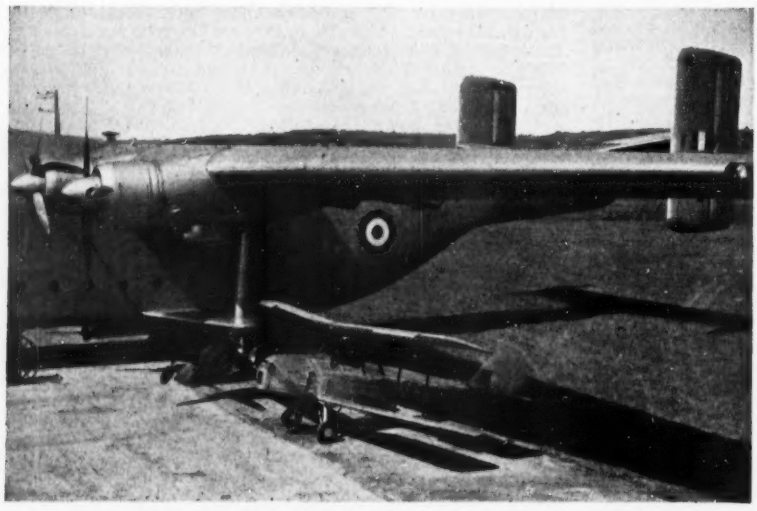
MR. JOCK STILL, one of the English Electric Company's production test pilots, left by air for Venezuela on June 10th for a visit of from one to two months. He is scheduled to give a number of Canberra demonstrations, and will assist the Venezuelan Air Force in the introduction of their new aircraft. For most of the visit he will be stationed at Maracai Air Force base.

### CanCar and Norseman

FROM Montreal comes news that the Canadian Car and Foundry Co., Ltd., has sold manufacturing rights in Norseman aircraft to a syndicate headed by R. B. C. Noorduyn, designer and vice-president of the original company, Noorduyn Aviation, Ltd., which ceased production of Norsemans early in 1946. The sole object of the new syndicate is to provide spare parts for existing Norseman aircraft.

### Engineless 500 Miles

RUSSIA is reported to have asked the F.A.I. to confirm a new world gliding record set up by a Soviet pilot, M. Ilchenlo. Flying a two-seat sailplane, with a passenger aboard, he is claimed to have covered 830 km (nearly 520 miles), from Moscow to a point near Stalingrad, in nine hours. The world record in this class is held by I. Kartachev, who flew 619.75 km in 1938.



*BIRTHDAY OUTING: June 27th will be the 21st anniversary of the first public appearance of the Blackburn B.2 trainer, at the first S.B.A.C. Show at Hendon in 1932. That the Brough company has since progressed to rather heavier metal is amusingly shown by this photograph, taken shortly before the B.2 left for the R.A.F. Garden Party at Hatfield last Sunday.*

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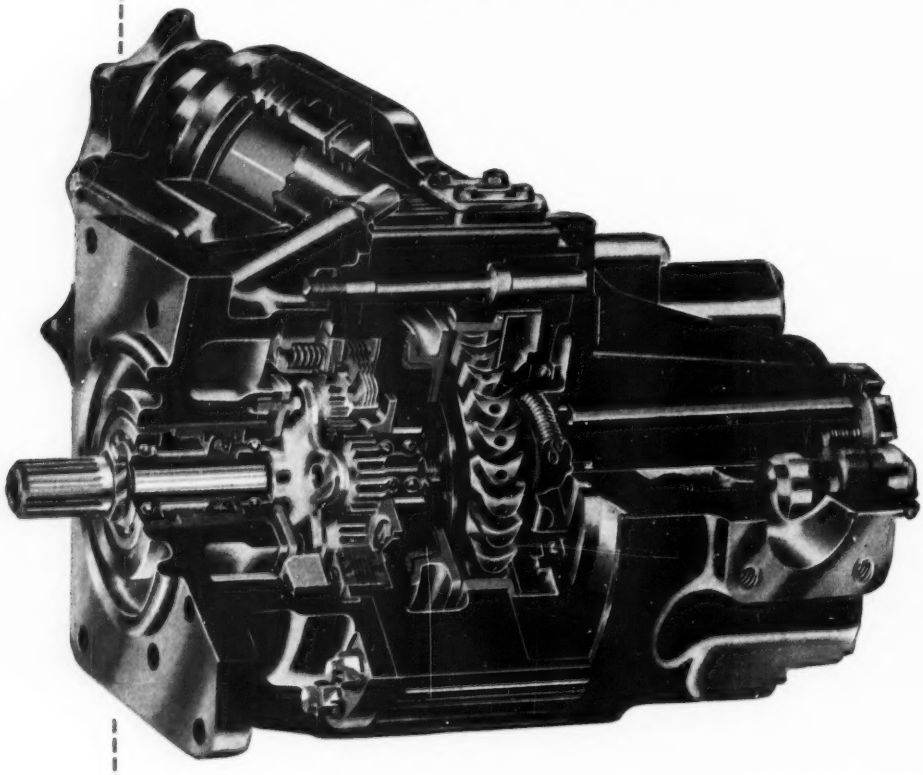

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# THE SHARP END

## *Britain and Australia in the Korean War . . .* 1

By H. F. KING, M.B.E.

*Sunderland "P-Peter," of a squadron of the Far East Flying Boat Wing, in which "Flight's" representatives flew to Japan.*

**AS was explained in our Coronation Number, the Assistant Editor's account of his journey from Singapore to Japan and Korea, and his experiences with the squadrons there, has been undergoing a somewhat protracted period of security-screening in Washington. Now at length we are pleased to present the first of three instalments to which this intimate and detailed narrative will run. Like its successors, it is illustrated with "Flight" photographs by L. W. McLaren (the only exceptions are the two bottom pictures on page 776). The second part of "The Sharp End" will be mainly concerned with the famous No. 77 Squadron, R.A.A.F., which flies Gloster Meteor 8s, and the final contribution will deal with the two great little Auster Flights of the Korean war—Nos. 1903 and 1913.**

THE military airway to Korea (or to "the sharp end," as one hears it called along the way) lies over the Mediterranean and Middle East, down the length of the Indian continent to Ceylon and across the Indian Ocean to Singapore. Then—skirting the troubled lands of Malaya, French Indo-China and Communist China itself—it strikes northwards to Japan.

As far as Singapore one may fly by Hastings along the trunk route of Transport Command, proceeding thence either by courier Valetta or in a Sunderland of the Far East Flying Boat Wing, in transit north for operational duty. For McLaren and myself it was a Sunderland, as we would have wished, for these grand old boats are salted veterans of the Korean campaign; and in order to join it we drove from Changi to the Wing's base at Seletar.

After many tiring days it was good to sit on a calm morning talking flying-boats with W/C. D. MacKenzie, D.F.C., the commanding officer, with a pair of white Sunderlands sunning themselves like swans on the apron outside his window. But as the wing commander talked, I came to realize that halcyon days are all too few in a Sunderland's Far East tour, for varied tasks in dispersed areas must be co-ordinated with the Korean commitment.

*W/C. D. MacKenzie, D.F.C., O.C. Far East Flying Boat Wing.*

Jointly with the naval forces of the C.-in-C. East Indies, and with vessels of the Pakistan and Indian Navies, the Sunderlands may range from China Bay, Ceylon, over the Indian Ocean; or they may venture—as they do whenever possible—into the rivers of Borneo, so that their crews may gain experience in alighting on rivers, in using their anchors, and in keeping a watchful eye for floating logs. (At Sibu forty small boats may be engaged at one time in pushing these hazards aside.)

If not so occupied the Sunderlands may be detached to Kai Tak for sea/air rescue; or detailed for a "Firedog"—harrying the Malayan bandits with 20-lb fragmentation bombs. Between 160 and 240 of these they carry in the bomb room, where they are feverishly fused and loaded on the four L.S. carriers by a team of "galley slaves." And, after bombing, the great boats skim the jungle to comb the target with their machine guns.

It may be that their services are called upon for the investigation of shipping approaching Singapore, or for participation with the French and Americans in joint patrolling of the South China Sea (in which case they operate from Catlai, an alighting area on the river at Saigon). Small wonder that their crews spend about half their time away from base, and that Seletar Sunderlands have flown 22,000 hr in two years.

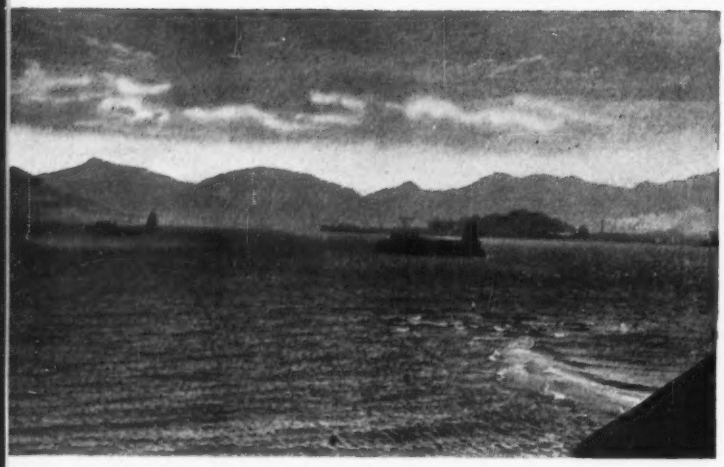
Of all the tasks which have fallen to the Wing, none is more pleasantly and proudly remembered than that which arose from H.R.H. the Duchess of Kent's visit to Borneo last year. As Her Royal Highness's personal aircraft, SZ578 had her bomb room and wardroom panelled and upholstered (for weeks the married-quarter tea parties buzzed with discussion of shades, tones and textures) and, supported by two other Sunderlands and two Valettas, *Powder Puff*, as she was soon dubbed, served Her Royal Highness faithfully and well.

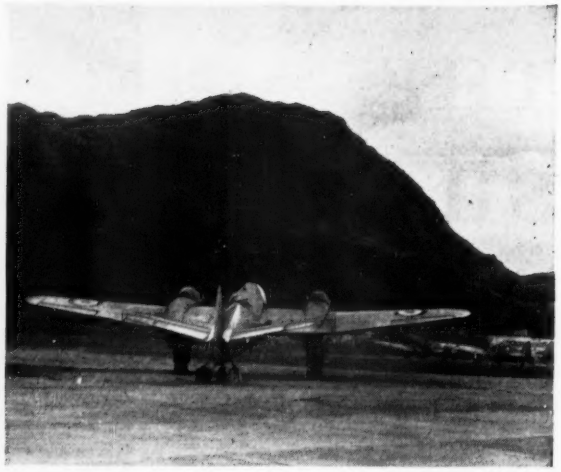
Captain of the Flight was W/C. MacKenzie, and F/L. K. G. Wells was the Duchess's personal pilot. The success of the tour, and especially the loyal demonstrations of the Dyaks, will not soon be forgotten by those privileged to serve on it; but the finery of *Powder Puff* is no more. In operational rig she takes her place with less favoured sisters on the "Tsushimas" (patrols in the Tsushima Straits), the weather recces, or come what may.

The affection of the Sunderland crews for their craft must be without parallel in any flying service. True, they are often to be heard binding about the overloading of the electrics; the upper-hull leaks which admit the tropical rain and play Old Harry with radio and radar; the constant vigil against corrosion and deterioration of the wiring; the frequent necessity for replacing de-icer shoes in the humidity of Singapore; and so on. But they wouldn't exchange for anything short of a P5Y or Princess.

Certainly the Flying Boat Wing works harder than many Far East organizations—seven days a week, with the ops. room open round the clock. And into the bargain it does its own major overhauls. Every Sunderland goes in for a "major" after 18 months, and is thus enabled to remain out-East for a similar period—and one in every two machines stays for a second major, thus extending its tour to 4½ years and, incidentally, effecting a saving of many thousands of pounds.

But our immediate concern is a Sunderland passage to Japan,





Above (left) are Sunderlands at Hong Kong. On the airfield at Kai Tak are seen (left) Hornets and (above) a Beaufighter T.T.10.

## The Sharp End . . .

and this we began from Seletar at 3.30 one dark, stifling-hot morning.

We blinked and nodded our way down to the marine craft pier, stumbled into a bomb scow and were motored out towards the white mooring light, marking Sunderland M.R.5, RN269, "P"-Peter. Like a sort of Jonah, or *Moby Dick* Ahab, we entered the carcass of the white, 60,000-lb monster.

The wardroom proved a trifle damp, for the previous day's rainfall of four inches in two hours (which, incidentally, had stopped our car dead on the Changi road) had penetrated the plating at a number of inconvenient points. A check of the planing bottom, watertight doors and ports, however, disclosed no lawful impediment to our departure, and Peter lifted clear after little more than a minute's run along the 2,000-yd flarepath.

We settled down contentedly with tea and a cigarette, little interested in certain activity centring round the trailing aerial fairlead. But the disagreeable significance of this—and of the dawn appearing on the wrong side!—was made clear by S/L. John Ormston, Officer Commanding Peter's squadron. He descended from the flight deck to give notice that, with the main aerial having gone for a Burton, and the trailing aerial playing up, we could not take a chance with the weather in prospect. So we returned to Seletar and alighted staidly at a weight of 54,000 lb.

The radio and radar (both of which were, in some degree, waterlogged) having been dried out overnight, we boarded Peter next morning, with the promise of cu-nim buried in alto-stratus, and the assurance that the front which had rested over Kai Tak for a fortnight was "moderately active and quasi-stationary." As we mused upon this intelligence Peter once again cast off and breasted the dark waters as the Twin Wasps were run up. No. 4 having developed a 150-rev mag. drop, we were once again ferried ashore; but only an hour passed before we were repeating the familiar trip in the bomb scow. Lightning played incontinently around the horizon and phosphorescence silvered our wake. It was 2.15 a.m.

After Peter had careered along for 1 min 40 sec (the navigator warns the pilot when 1½ min are up and the pilot himself marks the five green light-buoys), the captain thought better of it and throttled back.

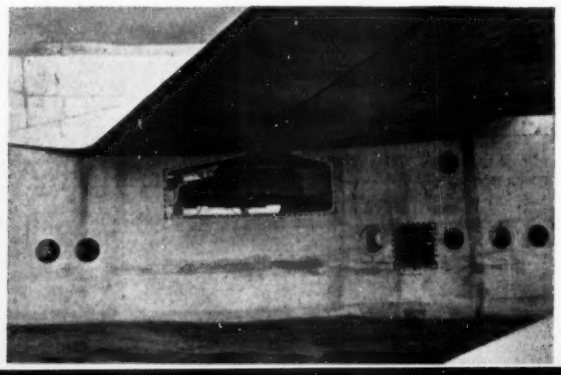
For his next attempt he had a pile of parachutes shifted forward and Peter now clambered not unwillingly into the blackness. The lightning flashed (presumably the thunder was playing second fiddle to Messrs. Pratt and Whitney) and Peter rode the bumps as a ship rides the waves. To heighten the nautical illusion there came a whimpering and wailing, for all the world as of ship's tackle; this proved to emanate not from the *Flying Dutchman*, as one could easily believe, but from the navigator's seat, as its occupant got to grips with his instruments, charts, and tin of 50 Players.

One soon comes to know one's companions on a Sunderland trip, and we found ourselves in distinguished company, for not only S/L. Ormston, but the captain (F/L. Robinson), the "nav." (F/L. Scholes), and the two gunners (F/Sgts. Tedman and Hood) served on the Royal tour. "Robbie," in fact, was second pilot on Her Royal Highness's aircraft. We were gratified to learn that we had no fewer than three signallers aboard, in the persons of Sgts. Nairn, Scarle and Saillard.

The lightning having subsided, the only relief from the darkness was a flame-float—which P/O. Sebright, the assistant navigator, popped through the tube to find a wind, and which burned bravely on the dark sea 8,000ft below—and the dawn, which came up like a blackened, mildewed, rasher of streaky bacon. This vista, nevertheless, proved appetizing, and we wolfed the more wholesome-looking rashers which F/Sgt. Tedman prepared in the galley next door (*"Hell's kitchen—Witches meet Thursday, 7 p.m."*). . . .

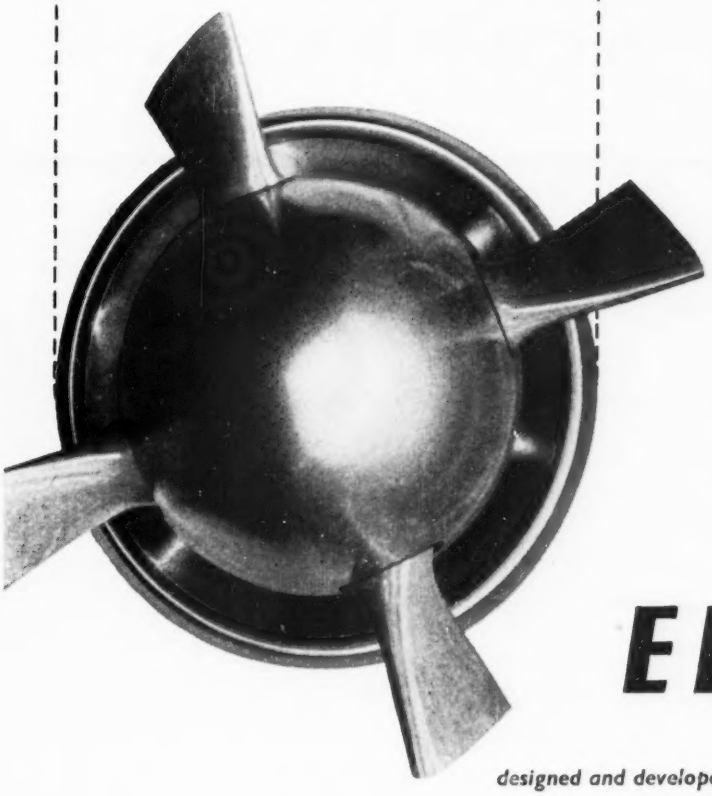
To shorten a 12-hour story, we were deviated from our course to seek more favourable winds inshore; and thus were not obliged to divert to Sengli Point, in the Philippines, as at one time we had expected. We crossed the Parecel Islands (and marvelled at the green glint on the clouds above them) and at length broke cloud over Hong Kong harbour. In spite of a sudden "clamp," we discovered Waglan Island, where we were directed, over our very weak radio, to turn for the run-in. Signposted by whitewashed

(Left) At Iwakuni (l. to r.) are F/L. W. J. Bishop, M.B.E., S/L. John Ormston and S/L. P. F. Eames. (Right) Depth charges aboard Sunderland "P-Peter".



# Three thousand e.h.p. in 36"

*The economies realised in the Eland design include an appreciable reduction of aerodynamic losses. The cowled diameter of 36" is very much less than has formerly been accepted for this power rating, and power plant drag is correspondingly lower.*



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*Specific consumption 0.48 lb./b.h.p./hr. at 30,000 ft. 350 knots cruising.*

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*The crane at Iwakuni, formerly used for lowering Japanese Baka "suicide" aircraft on to their launching ramp. To the right of the picture is a sunken cruiser; on the left can be seen a Sunderland of the Far East Flying Boat Wing.*

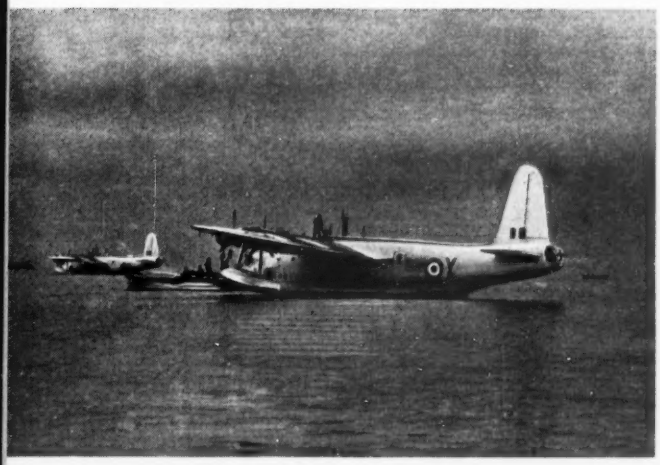
*Servicing the radar of a Sunderland at Iwakuni.*

## The Sharp End . . .

rocks marking Kai Tak approach, Peter nosed through the south-east gap. On "finals" we goggled round at the modern city of Kowloon, the massed junks in the typhoon shelter, and—with due respect—at the glowering mountains. With a certain relief we heard the squadron leader report, "Peter waterborne."

Though it was Sunday afternoon, and there was no Service activity, S/L. H. J. Houghton, D.F.C., the S.I.O., obligingly came over to the mess to put us in the local picture. Lying within a few miles of the Chinese border, Hong Kong is a stronghold of Hornets and Vampires. (A note concerning it and a coloured photograph appeared in *Flight's* Coronation Number.)

"Taking off towards south-east gap; stand by for turbulence," was the pilot's intercommed. announcement on our early-morning departure; following which F/L. Scholes regaled us with select tales of build-ups at Iwakuni and similar pleasantries. He recalled how two Meteors came through the top of a cu-nim upside down, and how a Sunderland found itself at 3,000ft, nose-down, with 160 knots on the clock.



*(Above) Sunderlands of the Far East Flying Boat Wing at Iwakuni. (Below) Mariners of the U.S. Navy, which operate from the same base.*

In and around Japan (he proceeded in less horrific vein) the Americans are most precise in their control of incoming and outgoing aircraft. There was some bother at the outset because they credited the Sunderlands with a higher ceiling than they could attain, occasionally ordering them up to such impossible levels as 9,500ft! Some disillusionment notwithstanding, acquaintance has led to respect and the Sunderlands are allowed the latitude due to their years and status.

The G.C.A. procedure at Iwakuni, the flight lieutenant explained, entails flying down the runway at 200ft, turning 90 degrees halfway along, and letting-down on to the water blind. This, we were assured, is "Quite O.K."

Our own approach to Iwakuni—over airfield-studded Okinawa, coral islands, volcanoes, pearling vessels, snow-sugared mountains, and power lines (beneath which more than one Sunderland has passed on its lawful occasions)—was relatively uneventful. We saw white Sunderlands moored with dark-blue Mariners of the U.S. Navy, and the airfield besprinkled with something like a score of different types of British and American landplanes.

"This had better be good, bows," cautioned S/L. Ormston, as Peter nosed in to pick up moorings—for he was jealously guarding his squadron's reputation under the eyes of a rival unit (which we were relieving) and, of course, the Americans. The buoy was hooked at the first attempt.

To assert that Iwakuni has everything is to lay oneself open to contradiction from certain inhabitants whose friendship we value; but it is true that it possesses facilities not only for the operation of all types of landplanes and flying-boats, but for storage and maintenance and transit accommodation. One vouches personally for having seen on a single morning (is this a spotting record?) at least one specimen, and in most instances several, of these aircraft: (U.S.A.F.) B-26 Invader, C-54 Skymaster, C-119 Packet, T-6 Harvard, C-46 Commando; (U.S. Navy) PBM Mariner, AD Skyraider, F4U Corsair, PB4Y Privateer; (R.A.F.) Sunderland, Hastings, Valetta, Auster; (R.A.A.F.) Meteor 7 and 8, Dakota, Mustang; (Fleet Air Arm) Firefly, Sea Fury, Dragonfly.

As Officer Commanding No. 91 (Composite) Wing, R.A.A.F., G/C. D. R. Chapman was good enough to receive us. He told us that Iwakuni is a U.S.A.F. base commanded by Colonel J. Morris, and provided by the Japanese on the basis of the provisions of an administrative agreement between the Japanese Government and the United Nations. The R.A.A.F. and R.A.F. are permitted to occupy a portion rent-free, and, in the group captain's words, the Americans are "marvellous to us" (even though L.A/C MacKeever did sweep the board in the Swimming Intra-mural Championships!).

The R.A.A.F. Wing, he said, comprised No. 77 (Fighter) Squadron, with Meteor 8s; No. 30 Transport Unit, with Dakotas (since replaced by No. 36 Transport Squadron); No. 491 Maintenance Squadron; a Meteor Conversion Flight; and No. 391 Base Squadron.

In Korea, No. 77 is under the operational control of the U.S. 5th Air Force, and at the period of our visit was chalking up between 22 and 34 sorties a day, "'flu, flak and weather" notwithstanding. The R.A.A.F. pilots, the group captain told us, passed through a Vampire O.T.U. in Australia and did not handle Meteors until they joined the Iwakuni Conversion Flight—commanded by an officer who had himself completed a Korean tour, and equipped with two Meteor 7s.

Group Captain Chapman gave us a vivid account of the operations of his two squadrons (we particularly appreciated his description of a Meteor nacelle "unravelling like a cigar" after a 37 mm hit), and his high opinion of them we later came to share.

As Officer Commanding R.A.F. Iwakuni, F/L. W. J. Bishop, M.B.E., is responsible, among other things, for providing advanced

*(Left) Supervising the preparation of an Auster for Korea is F/O. J. A. H. Sorrell, who commands the equipment and air movements section at Iwakuni. (Right) Hawker Sea Furies of the Fleet Air Arm at Iwakuni. In the background are Privateers of the U.S. Navy.*

## The Sharp End . . .

base facilities for the Sunderland detachment of the Far East Flying Boat Wing; for providing staging post facilities for visiting R.A.F. landplanes; and for the administrative control of the Casualty Evacuation Flight and Nos. 1903 and 1913 (Auster) Flights, while these Flights are under the operational control of the G.O.C., No. 1 Commonwealth Division in Korea.

The equipment and air movements section is under F/O. J. A. H. Sorrell, and the staff—trained for the double function—handle incoming and outgoing couriers, the "cas. evacs." and "specials." The aircraft servicing section deals with R.A.F. landplanes staging through, and is further responsible for the major inspections of, and erection of, the Austers for Korea. Additionally, there is a marine-craft section, for the functional use of the Sunderland detachment.

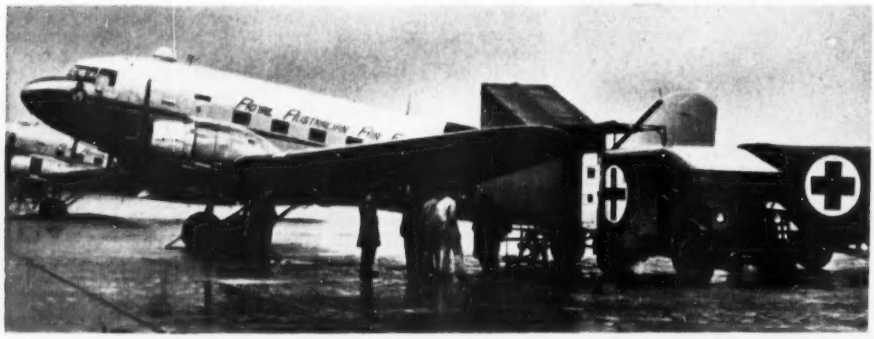
To hear something about the work of this detachment, which operates under the control of the U.S. Navy, we presented ourselves before S/L. P. F. Eames. He began by telling us of the anti-submarine patrols and shipping surveillance in the Tsushima Straits and Yellow Sea, which the Sunderlands undertake, turn and turn about, with U.S. Navy Mariners. Every other day—from Iwakuni or from a U.S. Navy AVP seaplane tender (from the stern of which they refuel)—they are out on an 8-hr sortie. Another task is night weather-reconnaissance in the Yellow Sea, beyond the Shantung Peninsula. These flights last for 8-10 hr, and they influence the operations of the Combined Naval Task Force and of shore-mounted air strikes. Then there are the occasional combined anti-submarine patrols and weather recces. towards Vladivostock; Task Force refuelling patrols; and convoy escorts.

At the time of our visit the night recces. were considered very little fun indeed. Freezing level at Iwakuni was between 500 and 2,000ft, and if a pilot went out I.F.R. to the Tsushima Straits, he could expect plenty of ice. Alternatively, to keep below icing level, he might map-read by radar to the Shimonoseki Gap and pass through blind at 1,200ft. Around the south-western tip of Korea (where it became necessary to descend to 800ft for patrol, and to take readings at four points down to 200ft, using the radio altimeter) the freezing level was likely to be found somewhere in the water.

In the absence of cabin heating, provision is made in the Sunderland for electrically-heated clothing, but for Korean winter operations the crews were dressing as though this were not the case. Continuous use of current by all hands had the unfortunate effect of overloading the generator and blowing fuses; and this being so, S/L. Eames favoured the following ensemble : short pants, "long johns," pyjama trousers, Aertex vest, two string vests, aircrew shirt, roll-neck sweater, battledress, electrically-heated "inner," lightweight flying-suit, flying-boots, gloves and scarf. The stern and waist gunners, who would otherwise have had the chilliest time of all, were permitted to keep themselves plugged in. Other crew-members were heated for a short spell every quarter of an hour, which, one might suppose, would afford some relief from the monotony—as did the occasional radar blips registered by supposed Tu-2s. On daylight sorties shipping photography offered a more agreeable form of diversion.

The Sunderlands have no radio compasses and in icing conditions compliance with American "airways" rules is not always possible; so these are waived to allow them to come into Iwakuni on VFR flight clearances or to grope their way round the coast by radar. We heard of one young pilot who had lately found himself icing up in cloud, with his VHF aerial useless and only very weak R/T. All but lost, he managed to find a hole in the clouds for a descent off the west coast of Japan, and so was able to set about finding the Shimonoseki Gap. In sleet and snow he put the Sunderland down on the sea and taxied at 8-10 kt for six miles through the gap. Once into the Inland Sea, he took off again and approached base IFR, in snow, at 600ft. The Sunderland passed under the South Gap wires at 50ft and put down safely at base. On more than one occasion a Sunderland has taken off and alighted four or five times between Shimonoseki and Iwakuni.

Visiting the moored Sunderlands in a bomb scow the morning after we arrived, we saw that two depth charges had already been secured in Peter's bomb room. The sight of fitters, radar technicians and armourers buckling down to their jobs in the bitter wind, standing in small craft, or precariously



*A Dakota of No. 30 Transport Unit, R.A.A.F., unloads Korea casualties at Iwakuni. (Below) First pilot of No. 77 R.A.A.F. Squadron to shoot down a Mig-15 in combat, F/L. Bruce Gogerly, D.F.C., receives the American Air Medal from Col. H. R. Thyng. (Right) F/L. D. G. M. Hills (R.A.F.) and Senior Sister H. Cleary (R.A.A.F. Nursing Service) doing the rounds at No. 91 (Composite) Wing sick quarters.*

# PROGRESS

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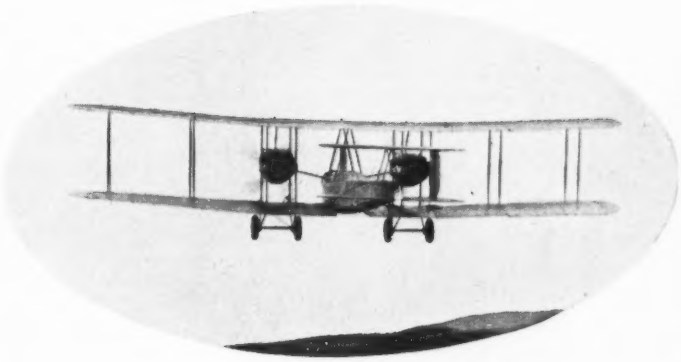

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**1952** On August 26th an English Electric Canberra made the first double crossing of the Atlantic, flying direct from Ireland to Newfoundland and back in 7 hours 58 minutes total flying time: Elapsed time 10 hours 3 minutes.

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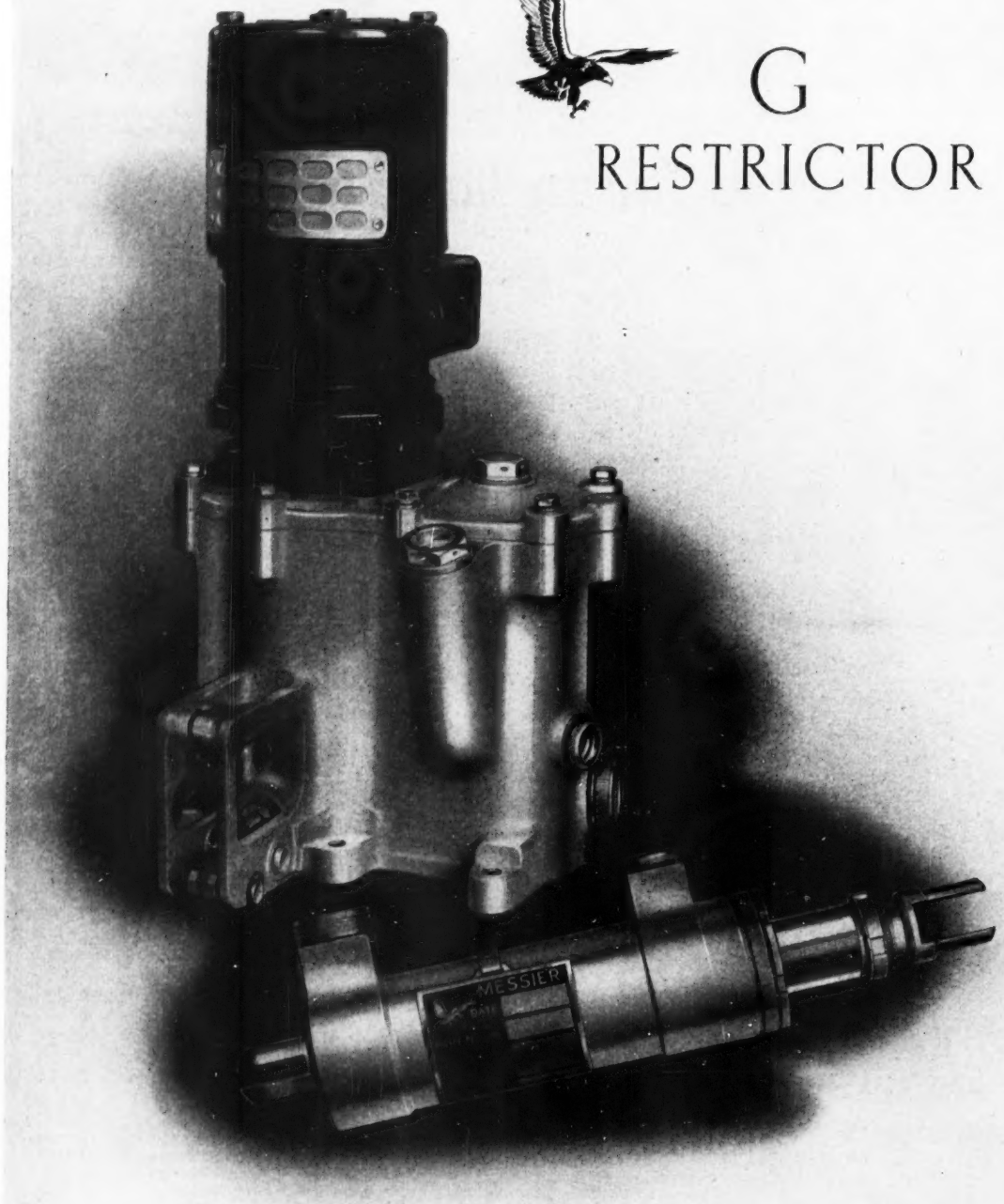


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## The Sharp End . . .

perched along the wings, was a timely reminder that it is not the flying crews alone who wage the air war.

The massive crane we saw towering above the quay was the same which hoisted Kamikaze "Bakas" on to their launching ramp —now destroyed; and half-submerged in the harbour lay the rusted hulk of a cruiser. The fineness of her lines belied an assurance that she dated from the Russo-Japanese war. On the horizon we made out a rock, against which Korea-bound Meteor pilots, taking a refresher course at Iwakuni, discharge their R.P.s; and in a quiet place near station H.Q. we were shown the little shrine where Kamikaze pilots performed their last rites.

The story goes that a Baka may still be seen on the sea bed; but though F/L. Bishop often searches from Austers, which he air-tests before their despatch to the front, he has never succeeded in spotting it.

A casualty-evacuation Dakota of No. 30 Transport Unit being due from Korea, we transferred our attention from the marine to the terrestrial side of Iwakuni. The incoming pilot proved to be S/L. M. S. Humphrey, D.F.C., the squadron commander, and, having cornered him, we elicited these facts concerning his unit—the partner of No. 77 Squadron for nearly three years.

Operationally controlled by the British Commonwealth Forces, its responsibilities included the transport of United Nations troops to and from Korea; casualty evacuation flights (or "med. evacs.," as they are more usually called in Japan and Korea); the support of No. 77 Squadron with equipment and personnel; the carriage of mail for Commonwealth Forces; and the transport of V.I.P.s in a special Dakota.

Its most valuable attribute was its dependability in all weathers, contributing factors to which were the trouble-free Dakota airframe and engines, radio compass, G.C.A. and Loran. The ground staff rose at 4.15 a.m. to get the first Dak. off to the front by 6; two, or perhaps three, others followed at 15-min intervals. Often the ground crews worked through the night. Each trip represented about 5½ hr flying—excluding holding time for G.C.A., which procedure was as often in demand as not. In spite of this high utilization, under some of the worst flying conditions in the world, the Dakotas were kept immaculate by Japanese labourers.

Since our return from Korea the news has been received that No. 30 Transport Unit has been replaced by No. 36 Transport Squadron, but that 30's aircraft, and most of its personnel, have been absorbed into No. 36 Squadron. "No. 30 Transport Unit's record in the Korean war has been outstanding," said Mr. William McMahon, Australia's Minister for Air; "its name disappears from the R.A.A.F.'s line of battle, but it will not be forgotten."

After an active morning, I returned to the mess and discovered, deep in a siesta (which was right and proper, for he was enjoying a fortnight's rest-and-recuperation-leave), F/L. E. F. Babst, one of the six R.A.F. pilots attached to 77 Squadron. He surfaced good-naturedly to give me a quick briefing on the squadron's activities—and a wholly unsolicited testimonial to the merits of the Meteor in the ground-attack rôle ("Jolly good aircraft for the job . . . comforting to have two engines . . . can take a beating . . . steady gun platform . . . 20-mil really makes a mess of vehicles"). But he added that, though the light flak was inconsistent in its intensity, it was not letting the Meteors have things all their own way. In his own opinion, the terrain was the worst difficulty. E/A. sightings were infrequent, but he reminded me that three Migs had fallen to Meteors—and by an uncanny stroke of luck, one of the pilots responsible entered the mess as we talked. He was F/L. Bruce Gogerly, D.F.C., R.A.A.F., newly returned from Australia on a non-operational tour, and I was glad to shake his hand before setting out in teeming rain for Haneda (Tokyo) and Korea.

# FOR STARTING COMETS

ON Wednesday of last week, in the presence of a number of senior executives of B.O.A.C. and other interested officials, the first of a number of powerful ground-starting units ordered by the Corporation was demonstrated at London Airport in conjunction with Comet G-ALYP.

There is an interesting background to the order. Early last year, Auto Diesels, Ltd., of Uxbridge, had built a prototype unit of outstandingly high performance; some details of its output were made public, but little more could be said about it, for it had in fact been designed for starting the four Sapphire turbojets of the Handley Page Victor, a prototype almost entirely shrouded in secrecy at that time.

It duly went into service for this purpose, and soon afterwards B.O.A.C. asked for a similar starter, but of even higher performance, which would not only be capable of fulfilling their present Comet requirements, but would also meet the demands of the Series 2 and 3 Comets and the Britannias. The requirements were met, and the result was a substantial order for these units for use at airfields, in a variety of climates and altitudes, on the Corporation's jet routes.

The equipment is a joint effort by a famous firm of electrical engineers—Crompton Parkinson, Ltd.—and Auto Diesels, Ltd., while the diesel engine is the work of Leyland Motors, for whose products world-wide servicing facilities are available. The engine drives two generators giving outputs of 450 amp continuously at 112 volts, and 750 amp continuously at 28 volts. In addition, it is stated, the unit will supply peak starting currents of 850 amp at 112 volts or 2,000 amp at 28 volts. Simultaneous outputs for 28-volt servicing and 112-volt starting are permissible up to 100 kW.

The generators dispense with the use of automatic voltage regulation, and by the system employed it is claimed that voltage can be held constant even under shock loads of 500 per cent above full-load current.

Protection is provided against overload, generator over-voltage and reverse current (i.e. feedback current from the aircraft) by means of a new technique employing sensitive relays and associated main-contactor tripping relays. All contactors incorporate a "no volt" device by which, on aircraft-plug disconnection, automatic tripping occurs without sparking.

The equipment includes 96- and 24-volt batteries, charged from the generators, to provide starting and servicing supplies when the diesel engine is shut down.

The whole of the operational control is from the panel visible in the photograph, with push-button selectors for the various services. Radio-interference suppression is incorporated. All instruments are on resilient mountings.

The handsomely finished trailer—the roof of which, incidentally, is strong enough to form a work-platform for two men—is well furnished with such accessories as interior lighting, obstruction warning light, static earth, fire-fighting equipment and cable stowage.

*The Auto Diesels ground starter in attendance on a Comet at London Airport.*

# A.S.T. DEVELOPMENTS

## *Three Dakotas Augment Instructional Fleet: New Engineering Equipment*

THE activities of Air Service Training, Ltd., both at Hamble and elsewhere, have been fully described in issues of *Flight* not long ago (June 20th and September 26th, 1952), but we recently paid another visit to Hamble in order to learn about some further new developments.

For a start, two changes on the board have recently taken place. As already reported, the managing director is now Air Marshal Sir Hugh Walmsley, K.C.I.E., C.B., C.B.E., M.C., D.F.C., while G/C. E. A. Warfield, C.B.E., D.F.C., is director of training. Under their direction, courses continue in four subjects, providing instruction in flying, navigation, engineering, and radio, and the staffs responsible for the first two of these subjects maintain a very close liaison.

Pupils from as many as 20 different countries are to be found working together, and this large overseas contingent is welcomed, both on general grounds and from the patriotically realistic viewpoint that personnel trained on British equipment will wish to continue using it in their own countries. Foreign Service personnel are also as fully eligible as are civilians.

Turning to the flying side, the authorities at Hamble claim that the airfield has the greatest number of daily aircraft movements of any in Great Britain, there being over 90 aircraft stationed there at the present time. The company's private fleet consists of five Chipmunks, five Austers, six Oxfords, two Ansons, and—a recent and important purchase—three Dakotas. Southampton University Air Squadron, who also use the field, operate five Chipmunks. Finally, a group of Service training units are still stationed there, although these are being closed down this year—No. 1 Basic Navigation School (closing this month), No. 14 Reserve Flying School (in August), and the Naval Signals School (in November). The E.F.T.S. at Ansty closed down last March.

All the aircraft now using the field are V.H.F.-equipped, and this fact has facilitated control of flying. In point of fact, however, the company's safety record has always been exemplary, there having been only one fatal civil accident in 21 years of operation. The landing runs available vary between 850 and 1,300 yd, and this has proved satisfactory, even for the Dakotas at 22,000 lb a.u.w. Full-load Dakota take-offs at 28,000 lb are made from Hurn airport. Night flying is carried out with the aid of goose-neck flares, and single-engined circuits with one airscrew actually feathered are practised both by day and by night. The C.F.I., who has 17 instructors and seven staff pilots under him, is W/C. H. A. C. Stratton, A.F.C.

The purchase of the Dakotas, which together with certain other items has involved the company in an outlay of £100,000 since September, now enables every grade of pilot training and refresher training to be given, from *ab initio* up to airline-captain standard. The instruction required to enable a beginner to obtain a Commercial Pilot's Licence extends over a period of one to two years, and cost to the pupil is of the order of £1,000.

Although every effort is made to keep costs to a minimum, £1,000 is clearly a considerable sum of money, which, in the mass, may eventually create a sizeable problem for the Corporations and charter firms. Up to the present time B.E.A. and B.O.A.C. have obtained the bulk of their pilots from discharged R.A.F. National Servicemen, but this source of supply will dry up in the comparatively near future, and the Corporations will then be faced with paying out a large sum for each prospective pilot. Charter firms will have the same problem. It would seem that, unless a Government grant is forthcoming, a serious situation may arise in regard to highly qualified civilian pilots in this country, and A.S.T., among others, are only too well aware of this fact. Costs are likely to rise rather than fall, as the expense of training pilots on jet aircraft will be higher than ever.

On the navigation side, S/L. C. H. Hoy, F.R.Met.S., stressed the extent to which captains of commercial aircraft are increasingly expected to be fully qualified navigators. Lack of meteorological information at great altitudes is, he said, a serious problem—as is well known—and far too little is known about jet streams, although examples with velocities up to 700 (repeat 700) m.p.h. have been encountered by crews of jet aircraft. Lack of new navigational equipment is another problem, and there seems little likelihood that existing devices can be superseded in the near future. A.S.T. are equipped to instruct in Gee, Loran, Decca, Rebecca, Babs and all the common radio installations, as well as giving practice in the use of the A.P.I. and G.P.I.

"Flight" photograph

*Pakistani students at A.S.T. receive instruction in engine maintenance.*

In the radio school, Mr. F. Barltrop said that very few air radio operators were being trained, partly owing to the fact that they are tending to become redundant in the Corporations—though not in the charter firms—and partly because of the current discouraging legislation, which stipulates two years' experience before a licence can be granted.

Finally, on the engineering side, Mr. F. Harris pointed out a considerable quota of new equipment. It includes a room fitted up for engine performance-testing, a jet-engine demonstration room, an aerodynamics laboratory with a variety of wind-tunnels and a fluid-tunnel, a materials laboratory for testing metals and non-metals (including plastics), and a room where the application of electronics to structures can be demonstrated. Mr. Harris stressed that the aim of the course was to teach maintenance of equipment rather than its design or manufacture.

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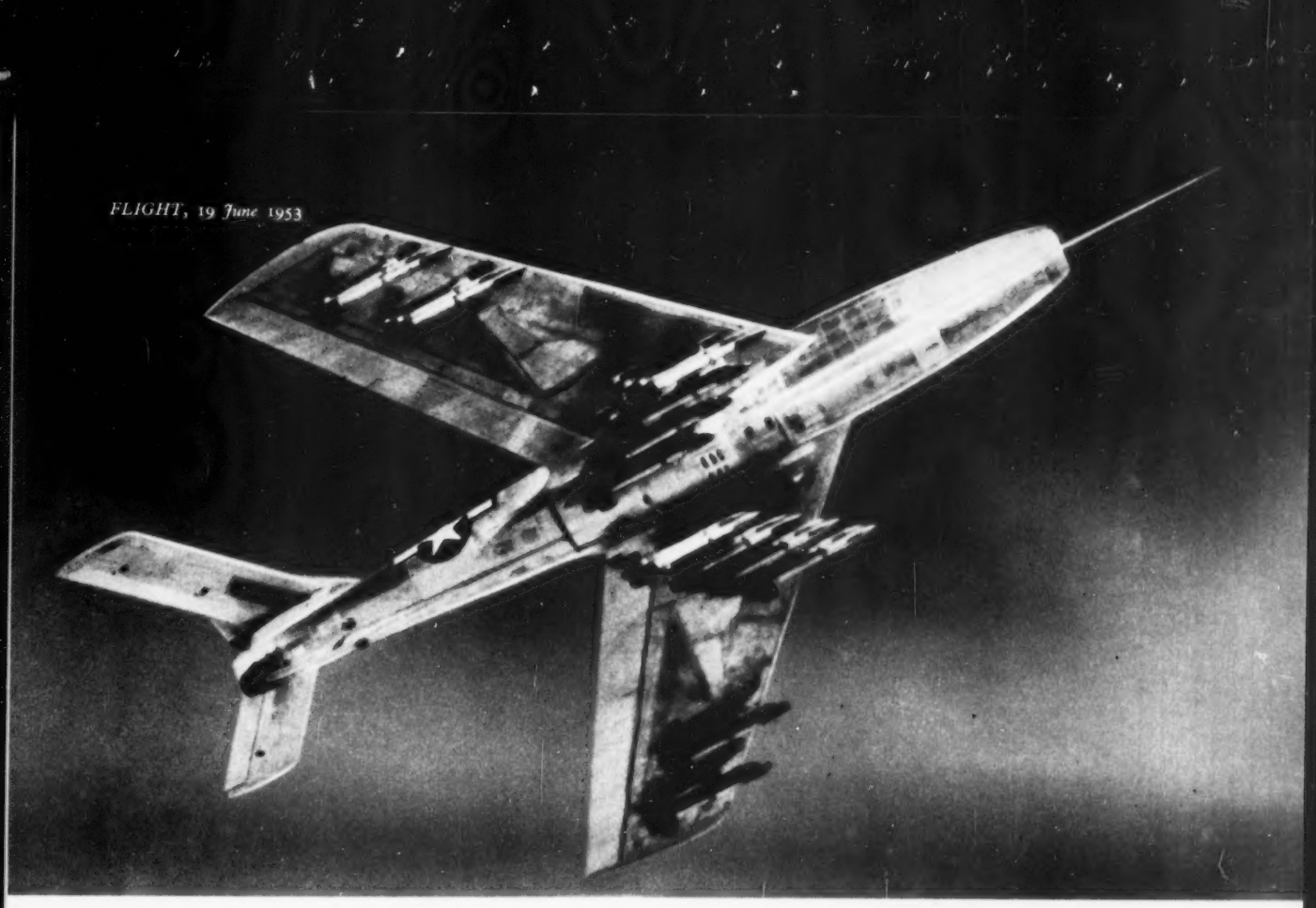
## FIRST AID FOR HELICOPTERS

MENTION has not infrequently been made in *Flight* of the advantages of the Decca Navigator and the Flight Log as aircraft navigational aids, and recently we were able to see a short film made by the Decca Navigator Company—principally for exhibition at the helicopter symposium during the sixth I.A.T.A. Technical Conference at Puerto Rico last April. The object of the film—admirably realized by its script-writer, and with advice from the company's technical staff—is to give the layman an idea of the principles of Decca navigational aids, and of the way in which they can be used in helicopters. (A short article on this subject appeared in our issue of May 15th last.)

*The Decca Navigator for Helicopters* (which runs for approximately 12 minutes) is simply presented, with a most welcome absence of background music, a clear and concise commentary, and an opening sound-track which is original and pointed. During the film, a B.E.A. S.51 is shown making a short journey from Gatwick to Eastleigh and thence eastwards, and it is possible to see the airborne Flight Log tracing the progress of the flight. Apart from the flying sequences, a short and simplified explanation of the Decca system is given; it includes the basic principles of the master and slave station operation, and animation is used to show, among other points, the ability of the system to work at low altitudes, at all ranges—through the employment of long-wave transmissions—whilst the simple methods of setting-up the equipment before a journey are clearly shown.



# Turbojet for Western Defence

Large scale production of the Sapphire turbojet is now under way in the United States of America. The Wright Aeronautical Division of the Curtiss-Wright Corporation is building it under licence, as the "Wright J.65" — to power the Republic F-84F (Thunderstreak) fighter.

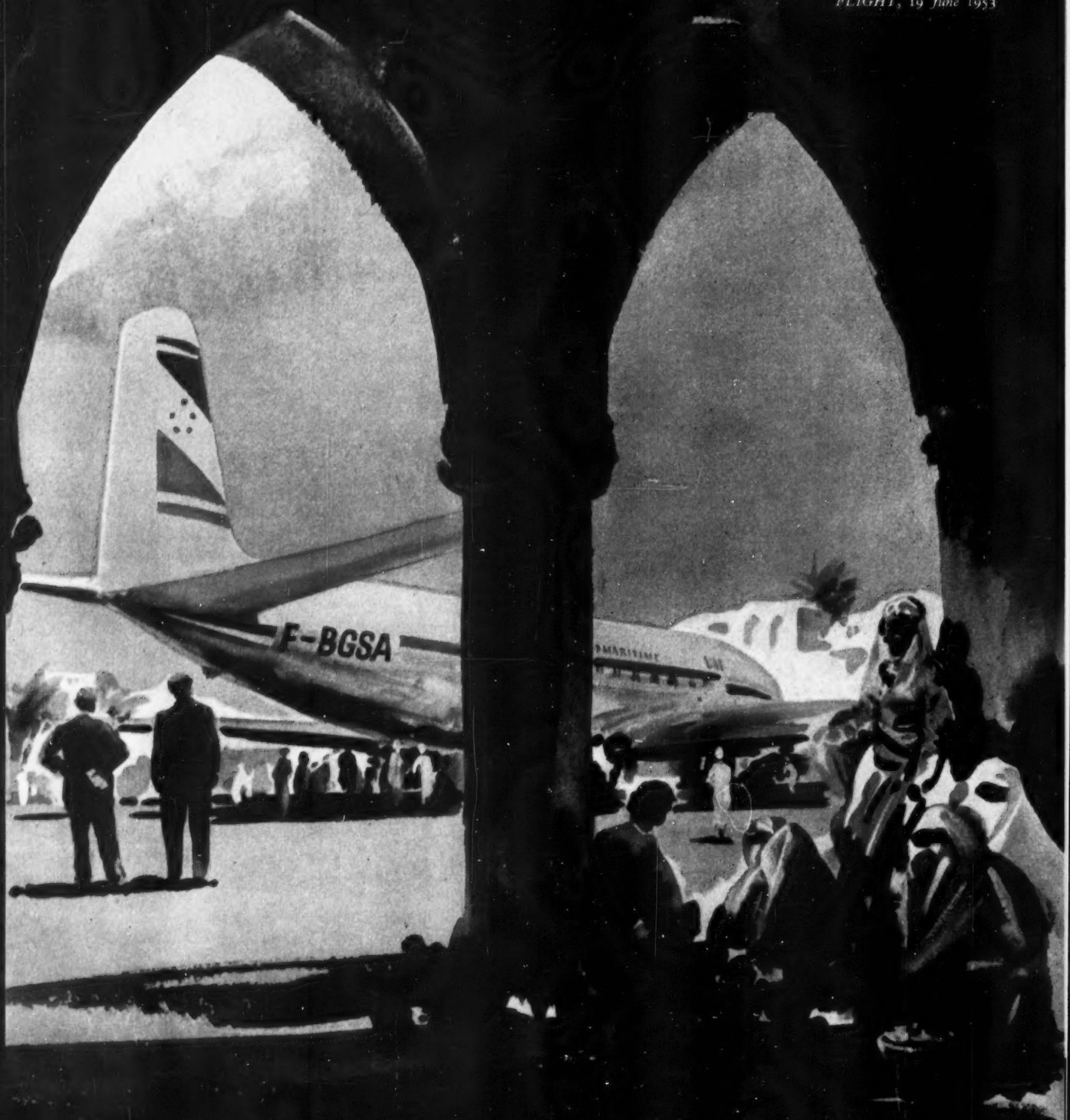
**WRIGHT** **ARMSTRONG SIDDELEY**

**J.65 — Sapphire**

***TWO NAMES – ONE ENGINE***

**ARMSTRONG SIDDELEY MOTORS LIMITED · COVENTRY**

*Members of the Hawker Siddeley Group*

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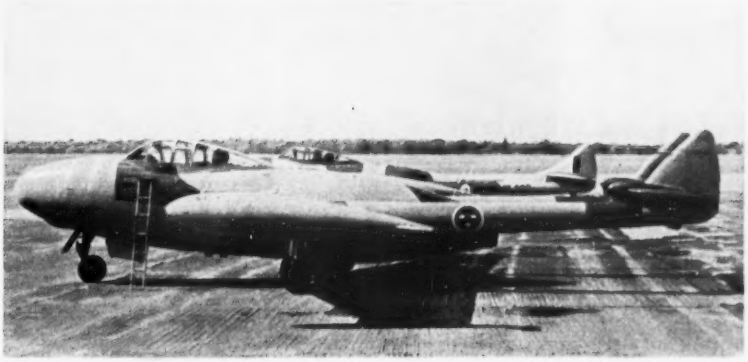
# DE HAVILLAND COMET

(de Havilland Ghost jet engines)

D H AIRCRAFT

D H ENGINES

# AIRCRAFT INTELLIGENCE



*VENOMOUS TAILS: In the foreground is a Venom night-fighter of the Swedish Air Force, and behind it stands an R.A.F. N.F.2 with the latest type of tail. All existing Venom night-fighters are to be modified in this way to improve spinning characteristics.*

## Great Britain

*Vickers Viscount.* B.E.A. are now operating six Viscount 701s, which between them have flown over 2,000 hr with 98 per cent regularity. Air France are in possession of their first Viscount 708 (F-BGNK), which is being used at the present time for conversion training. According to a report from India two Viscounts are to be supplied to the Indian Air Force.

## France

*Marcel Dassault Mystère II.* The following authentic data concerning this fighter are now to hand. Span, length and wing area are, respectively, 38.12ft, 38.32ft, and 326.15 sq ft, and alternative power units are the Hispano-Suiza Tay of 6,280 lb thrust, or the Atar 101C of 6,170 lb thrust. The gross weight, with 330 gallons of fuel and 300 rounds of 30 mm ammunition, is 14,330 lb. In addition to two 30 mm guns (presumably of Hispano-Suiza type) and radar range-finding equipment the Mystère II carries V.H.F., I.F.F., V.O.R., D.M.E. The maximum speed at sea level is 671 m.p.h., the service ceiling is 59,050ft, and the initial rate of climb 9,449 ft/min. At an unspecified altitude and at a Mach number of 0.99 the aircraft is claimed to be still controllable in pitch. Controllability at altitude is, in fact, such that an acceleration of 4.2g is attainable at 39,400ft at a Mach number of 0.86.

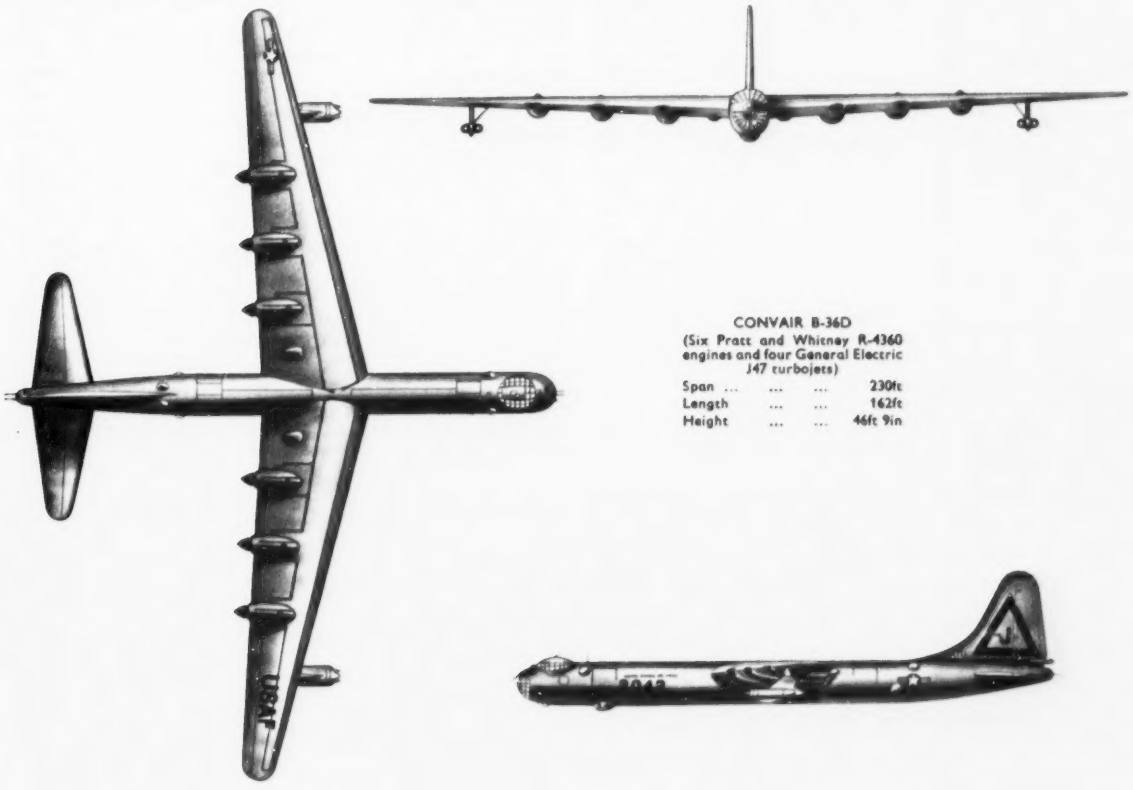
## U.S.A.

*Douglas AD-4B Skyraider.* This "special weapons" variant of the Skyraider is thought to have established a new load-carrying record for single-engined aircraft when it recently took off with a "useful" load of 11,944 lb. Thus, it carried appreciably more than its own weight, for its basic weight is quoted as 11,798 lb. It seems that the figure for the basic weight included four 20 mm guns, ammunition, fuel, etc., and that the total load, including three 2,000 lb, six 500 lb, and six 250 lb bombs, was 14,941 lb.

*North American YF-100.* Otherwise known as the "Sabre 45," which figure denotes the angle of sweepback of its mainplanes, this latest North American fighter made its first flight recently at Edwards Air Force Base, California. In general the type looks like a large Sabre; it has already been ordered into quantity production. The turbojet is a Pratt and Whitney J57 with afterburner, and the total available thrust is about 15,000 lb. Gross weight is believed to be in the region of 24,000 lb.

## Chile

*Beechcraft Model B45 (Mentor).* The Chilean Government has signed a contract for a million dollars worth of Beechcraft Mentor two-seater primary/basic trainers. Bearing the U.S.A.F. designation T-34A, the Mentor is powered by a 225 h.p. Continental engine giving it a top speed of 189 m.p.h., a service ceiling of 20,000ft, and a maximum range of 975 miles. The Chilean version will be known as the Beechcraft Model B-45, and will differ only in accessories.



CONVAIR B-36D
(Six Pratt and Whitney R-4360 engines and four General Electric J47 turbojets)

| | | | |
|---|---|---|---|
| Span | ... | ... | 230ft |
| Length | ... | ... | 162ft |
| Height | ... | ... | 46ft 9in |

# HAPPY RALLY

## *A Memorable International Week-end in Yorkshire*

WITH very few exceptions, air rallies since the war have been one-way engagements; members of British flying clubs having been invited year by year to enjoy the hospitality of similar organizations in several Continental countries. Best known, perhaps, are the week-ends arranged for Royal Aero Club associates at Deauville and La Baule. But there have been many other more personal occasions in Holland, Belgium, Spain, and even farther afield. With characteristic determination and hospitality the Yorkshire Aeroplane Club, based at Sherburn-in-Elmet, decided as long as five years ago that they would try to return some of the kindness and generosity shown to their members flying abroad by running an invitation rally of their own.

Now, in the fifth—Coronation—year, they have succeeded in organizing a most successful and enjoyable get-together for some seventy guests who arrived in 28 aircraft and represented eleven different nations. The Editor was among those fortunate enough to take part, and, with experience of many air rallies, *Flight* feels qualified to express an opinion on the organization at Sherburn and Harrogate. In our opinion there can seldom have been a better-managed affair or one with a more pleasant atmosphere. We know that in addition to the good fellowship all round, this is the result of experience carefully gathered from other rallies and of very hard and sympathetic work in preparation. All but the man himself, perhaps, would admit that a great deal of the credit is due to Mr. Ronald H. Braime, the chairman of the Yorkshire Club—assisted by his vice-chairman, Mr. Arnold Wilson.

But credits are not due only to the hosts; we have the greatest admiration for the guests—in particular, for Major and Mrs. Bremer who flew their vintage Junkers machine from Finland (it is an open tandem-cockpit type, 23 years old, and has flown round the world with the Major at the controls), and for Mr. Dardignac and passengers from Oran, who tackled a 3,000-mile round trip in their Norecrin.

Members of other British Clubs who fly abroad will be glad to hear that several of their most cheerful hosts were present in Yorkshire—including Mr. Freddy van Gheluwe, president of the Association of Belgian Flying Clubs, and Mr. Rein Uges, heading a large contingent from Holland. France, Denmark and Luxembourg were also well represented, but unfortunately the Swiss contingent were unable to get through the bad weather.

The well-balanced programme was, briefly, as follows: After arrival, lunch, drinks and hellos all round at Sherburn, everyone went by car or bus to Harrogate, where all were accommodated together at the Cairn Hydro Hotel.

On both the Friday and Saturday evenings, dinner and dancing was arranged, and there were some toasts and speeches of welcome, reminiscence and thanks. On the first evening the Mayor of Harrogate, with the Mayoress, dined with the rally party, responded for the guests, and danced with them. Other speakers were Messrs. Braime, Arnold Wilson and—in most witty style—Jack Rice from Leicester, who proposed "The Club."

*(Top) At Bolton Abbey a fast time across the ancient stepping-stones is made in the presence of Danish, French, Italian and Belgian witnesses. (Lower) Indicative of the international outlook of the Yorkshire Aeroplane Club is this signpost at their headquarters at Sherburn. (Left) Every visiting pilot received a tankard, and all other visitors an attractive silver Coronation dish.*

On the Saturday an enjoyable drive and walk to Bolton Abbey, with an excellent lunch at the Devonshire Arms Hotel, constituted the morning programme. The sun came out, the drive was not too long, and everyone was obviously happy to spend a few hours in the delightful Yorkshire countryside. At the Abbey there were those who refused to use the footbridge and instead splashed across the river by the ancient stepping stones. Tea was taken at Sion Hill, Kirby Wiske, at the fine home recently acquired by Mr. George Wiles, a Yorkshire Club member, who made all the rally his guests for an hour or two.

At the final dinner every visiting pilot from abroad received a handsome silver tankard, and every passenger a silver coronation dish—souvenirs really to be treasured. A surprise for the Yorkshire Club was the presentation by Mr. Uges of a lovely Delft dish of deepest blue from the Netherlands visitors. From the Belgian contingent the Club received a pennant and badge.

On Sunday most guests took their leave from Sherburn around lunch-time, the talk being mainly of the fine weather, the even better forecast, and next year's Yorkshire rally.

*Visiting machines bringing the guests from eleven countries to Sherburn-in-Elmet. Less familiar types which may be recognized are the veteran Junkers Junior (left background), Norecrins, Fairchilds, KZ-3, Pipers and Ercoupes (foreground).*

# THE COMET ACCIDENT—Report from Calcutta

LAST Monday was published the report of the Court Investigation instituted by the Government of India into the accident to Comet G-ALYV which occurred shortly after take-off from Calcutta on May 2nd. The cause of the accident is not definitely established, but probable causes are suggested, and one assessor, Shri N. Srinivasan of the design department of Hindustan Aircraft, Ltd., gives in Appendix 7 to the report some personal deductions regarding the probable cause of structural failure.

On the recommendation of the Court and at the request of the manufacturers of the Comet, the wreckage is being transported as soon as possible to this country in order that a detailed technical examination may be undertaken with a view "to determine the primary failure and to consider if any modification in the structure of the Comet aircraft is necessary." The Court of Inquiry consisted of N. S. Lokur, K. M. Raha, N. Srinivasan and T. R. Nelson. It was assisted by Shri Y. R. Malhotra, inspector of accidents, and by D.H. and B.O.A.C. experts from England.

The accident occurred at Jagalgori, a village about 24 miles from Dum Dum Airport on a bearing of 277 degrees T. The Comet was on a scheduled return flight from Singapore to London, carrying 37 passengers and a crew of six. Six minutes after take-off, which was normal, radio contact with the aircraft was lost, and it was last heard by Calcutta at 1105 hours G.M.T. calling Delhi. About that time, cultivators residing in villages around Jagalgori saw the aircraft coming down in a blaze of fire through severe thunderstorms and rain.

The report gives details of weather conditions which included scattered thunderstorms and cu-nim and a forecast of moderate turbulence. The report goes on to indicate that navigational aids were adequate for the flight, as was the fire-fighting equipment. The weather conditions at take-off were well above the minima, and the captain was duly briefed and cleared. The report states that "the captain was not only well qualified but had considerable experience of weather conditions on this route. He was therefore fully competent to judge the weather forecast en route and the warning given, and make up his mind whether to take off or not." The report continues: "The storm which the Comet encountered, as the eye witnesses from the neighbouring villages state, was unusually severe."

Before stating briefly its findings, the Court adds under the heading "Discussion of the Evidence": "We have no evidence before us to indicate sabotage or a stroke of lightning, or faulty workmanship or defective material. There being thus no direct evidence as to the cause of the failure of the Comet to get safely through the storm, we have to infer it from the state of the wreckage, which was distributed over a large area. There is no doubt that, as an expert witness, Mr. Lett, has stated, the aircraft suffered a complete structural failure in the air and thereafter the aircraft was on fire in the air."

The Court states the belief that the conclusions given by the one assessor are quite plausible, but thinks that a further prolonged technical study of the wreckage will be necessary to verify his deduction and determine the sequence of failures. This may take nine to twelve months.

The Court's findings indicate that at take-off all was in order with the aircraft regarding C. of A. licences, all-up weight, flight information and clearance. Item V of the findings states: "The aircraft encountered a nor'wester squall with thunderstorm shortly after take-off when climbing to its cruising altitude, and suffered structural failure in the air, which caused fire." In the Court's opinion the failure was due to over-stressing resulting from either severe gusts or from over-controlling, or loss of control, by the pilot when flying through the thunderstorm.

In addition to recommending a detailed technical examination, the Court feels that consideration should be given to the desirability of modifying the flying-control system of the Comet to give the pilot positive feel of air loads on the control surfaces.

The report gives in considerable detail the condition of all major components and pieces among the wreckage. The undercarriage and flaps were retracted; the throttle levers were broken and jammed in the half-open position; fuel cocks were on; the flying-control system change-over levers were in their normal position; elevator and aileron trim was normal; the cabin was being pressurized; the fire extinguishers had not been operated, nor was there any evidence of any emergency procedures.

Some extracts from the statement of damage to main airframe units are as follows: Both outer wings had failed at a station outboard of rib No. 7. Both tailplanes had suffered impact damage in the air. There was no structural damage to the fin panels. The lower fin and rudder had suffered extensive impact damage. The port elevator had been cut in two pieces, and the spar showed bending failure at a station in between No. 3 and No. 4 hinge brackets. It indicated a compression failure on the top flange and a tension failure at the bottom, that is, a down load failure. The starboard elevator spar had failed in bending, significantly at the same point as on the port elevator.

The deduction of Shri N. Srinivasan, to which we have referred, contained the following passages:—

"A close examination of the spar in either elevator shows a bending failure at a station in between the No. 2 and No. 3 outboard hinges. It is a down-load bending with compression at the top flange and tension at the bottom. It is significant that this failure is of a localized nature with no damage over the surrounding area either in the tailplane or elevator skin, in spite of the subsequent impact damage observed on other portions of the structure. This elevator down-load failure may have been due to a "pull-up." The down-load on the tail-unit seems to have caused a fuselage failure in bending at bulkhead No. 26. The top panels have failed in tension and the bottom panel in compression.

"It is understood during the investigation that the wing was subjected to a static test by the manufacturing firm during the development stage of the aircraft. On one test-piece static and fatigue tests were conducted alternately. The wing failed in fatigue test and after modifications was subjected to a static test. The wing failed again at 90 per cent of the ultimate load. The failure was attributed to the fatigue test conducted before. Modifications were carried out again, and without a re-test, it was found satisfactory for the ultimate load on theoretical considerations. The fatigue failure during static test occurred at Rib No. 7 where the cross-section changes from two heavy spars to an outboard shell construction. In this accident, again the wings have significantly failed at Rib 7. Whatever the load may be the failure at Rib 7 may indicate the lack of proper diffusion of the wing loads on to the two spars at Rib 7. In the absence of design data no definite comments can be made on the wing failure, but a further investigation on the above subject of load transfer at Rib 7 will be helpful.

"It is extremely difficult during this short period of investigation with limited facilities and data to substantiate the primary failure with all details, but there are strong indications on the wreckage to suggest the primary failure of the elevator during a "pull-up." The Comet has got an elevator control system operated with booster power with no feed-back arrangement for pilot feel. It is quite probable that the pilot, who is accustomed to a sort of "feel" on the controls during manœuvres had overcontrolled the aircraft beyond the limit that would impose the design loads on the aircraft."

Following the publication of the report, the following comments were made jointly by the de Havilland Aircraft Co., Ltd., and B.O.A.C.:—

"The report is agreed in that the aircraft met severe gusts in thunderstorms. The force of the gusts has not been possible to determine, but it is probable that they were of an unusually high order.

"It is not possible until the detailed examination, now under way, of the aircraft wreckage has been completed at the Royal Aircraft Establishment to determine the sequence of structural failure. Until such a sequence is determined it is only possible to theorise on the cause of the accident.

"The very considerable flying experience including many flights in turbulent conditions over the last three years by B.O.A.C. and de Havilland's with Comet aircraft does not suggest that over-control or loss of control by the pilot was likely."

## REFRIGERATING TUNNEL

BELIEVED to be the largest commercially owned wind-tunnel ever built, a new low-temperature tunnel is now being erected by Lockheed Aircraft at Burbank, California, and is scheduled for completion by next August.

It will be about 73ft long and will have a working section of about a square metre. The refrigeration system will have a capacity of 1,165,000 B.Th.U./hr and at zero temperature it will be possible to test components at a simulated speed of 200 m.p.h.; higher speeds will be obtainable in the upper freezing ranges, or lower speeds down to − 50 deg C.

The airflow will be chilled by a massive "gridiron" of refrigerating tubes, and for icing tests it will be possible to introduce a water spray of any required droplet-size.

Oddly enough, some of the directing-vanes in the tunnel will be steam-heated; the reason of course, is that they would otherwise become iced up. Normal aircraft de-icing methods would not be effective in the conditions under which the tunnel will operate.

## FOKKER'S BRAZILIAN PROJECT

REPRESENTATIVES of the Fokker Company have recently visited Brazil in connection with the organization of a concern which is to build a factory and manufacture aircraft in that country. The capital will be subscribed by the Brazilian Government and public and by the Dutch company. According to the preliminary agreement the factory will produce 100 S.11 basic trainers, 50 S.12s (nosewheel version of the same type) and 50 S.14 jet trainers in four years, the Fokker group supplying machinery and technical staff.

The cost of the 200 aircraft, if all are taken by the Brazilian Air Force, will amount to about £7,100,000. The factory may be built on Governador Island, in the Guanabara Bay, or at São Jose dos Campos, São Paulo, near the Technical Aeronautical Centre.

# REVIEW OF

## *The Historic Proceedings at Spithead*

FLIGHT

MONDAY, June 15th, was the Navy's day to salute our newly crowned Queen. From the water and in the air they accorded Her Majesty a warm and respectful welcome.

Massed in Spithead lay great ships of war and commerce, together with small—often strange—craft of diverse callings. Among them, at three-thirty in the afternoon, moved the Royal Yacht, H.M.S. *Surprise*, bearing the Queen and the Duke of Edinburgh to receive the full honours of Naval tradition; and dominating the scene were nine aircraft carriers.

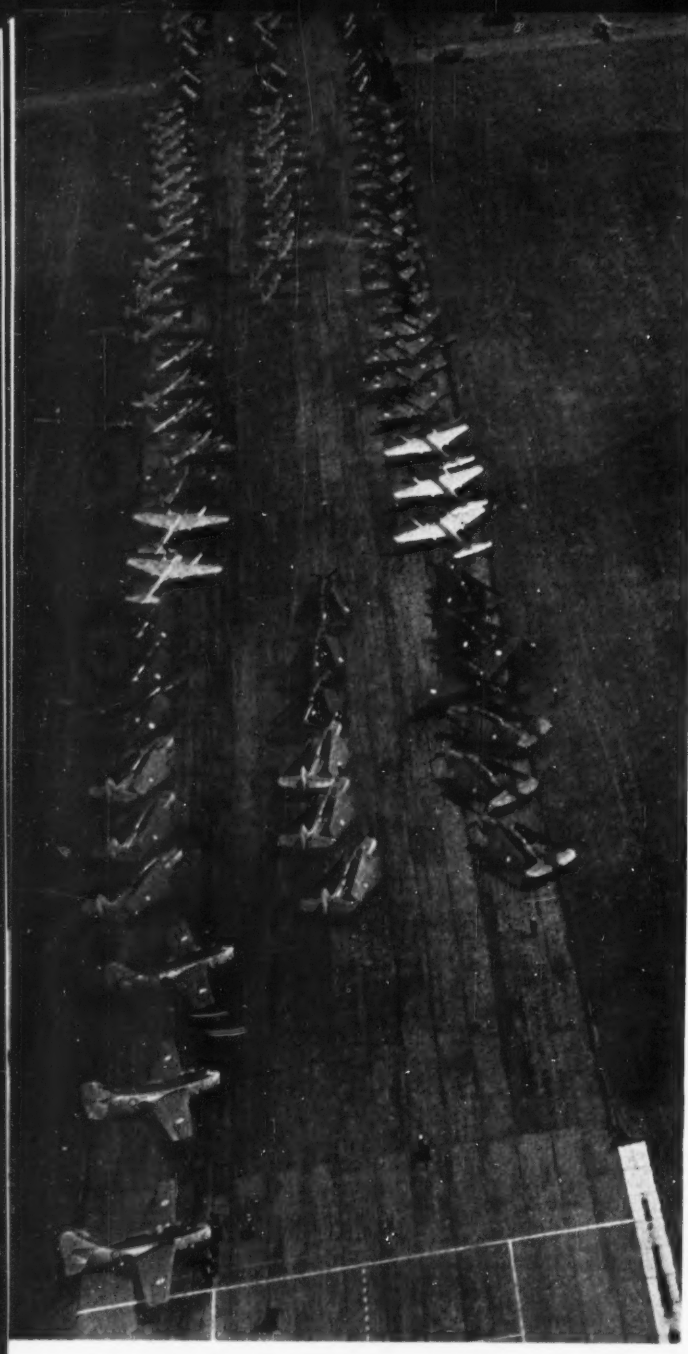
Her Majesty having reviewed her Fleet, H.M.S. *Surprise* was brought to anchor at the head of one of the lines, whereupon it was the turn of some 300 Naval aircraft to fly past. These were drawn from the carriers taking part in the review, from Naval Air Stations of Home Air Command, from the Royal Australian and Royal Canadian Navies, and from the Royal Naval Volunteer Reserve.

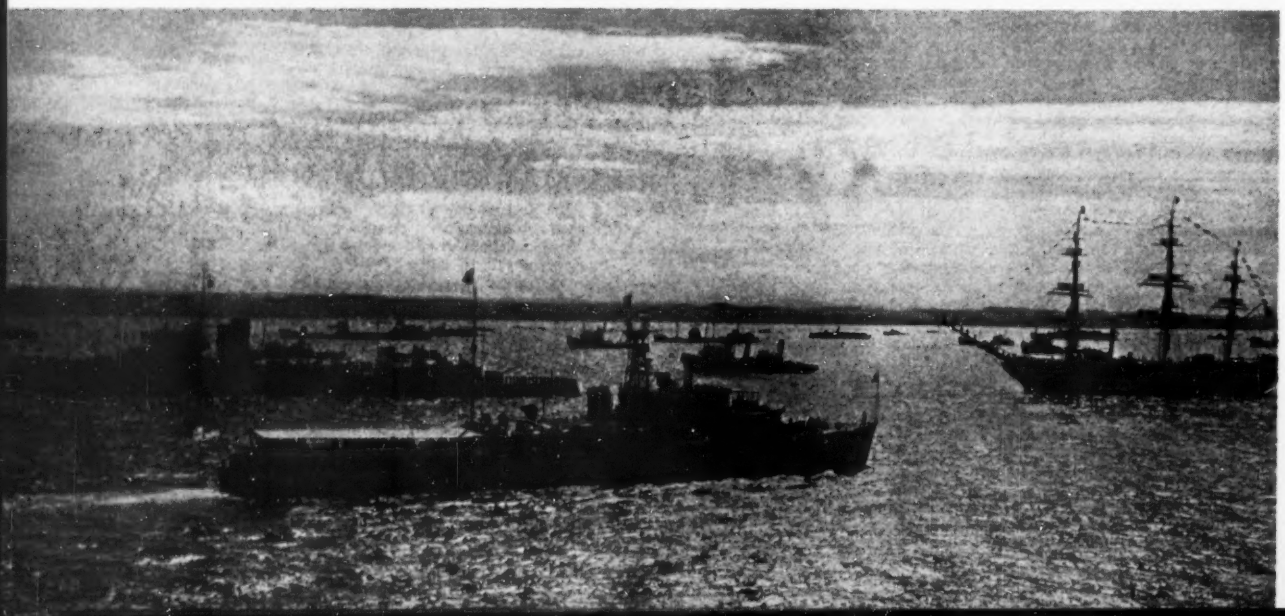
Eye-witness accounts of these memorable scenes follow, by a member of the staff of *Flight* who watched from H.M.S. *Theseus*, and by another who, in a Meteor T.7, participated in the fly-past.

**The Scene from H.M.S. "Theseus".**—The atmosphere at Portsmouth, always nautical, possessed on the morning of Review Day something special. That sense of expectancy barely subdued, and general air of informality—almost gaiety—that London had known before Coronation Day was again evident, as the mixed crowd of visitors waited at the Middle Slip jetty for their transport to H.M.S. *Theseus*. They included friends and relatives of the ship's officers, and representatives of other Services.

Soon we were moving out from the landing stage in a converted L.C.T. whose name, as far as one could gather from the lifebelts, was "R.N. Air 2F." An S-55 of the Canadian Navy droned overhead as we passed the Royal Yacht and continued past the Harbour Station towards the blockhouse fort at the entrance to the harbour. Behind us came other craft of various sizes, busy taking people to and from the ships of the fleet; fast launches sprayed exhilarating white furrows through the green water, while a landing-ship tanker ahead of us proceeded in a much slower and more sedate manner.

The beaches of Southsea, already crowded, passed on our left as we obtained our first view of the warships ahead. Heavy grey silhouettes—the carriers alone could be clearly picked out—in the distance contrasted with the small, beflagged yachts tossing at their moorings before the Elbow Spit buoy in the foreground.





*(Left) The assembly of airscrew-driven machines at Lee-on-Solent. Gannets, Avengers, Firebrands, Sea Hornets, Fireflies and Skyraiders may be (or may not be) identified. (Below) The Royal Yacht "Surprise," seen from H.M.S. "Theseus," passing the Dutch "Tromp" and the picturesque Italian "Amerigo Vespucci" with her yards manned.*

# THE FLEET

## *Observed from Sea and Air*

PHOTOGRAPHS

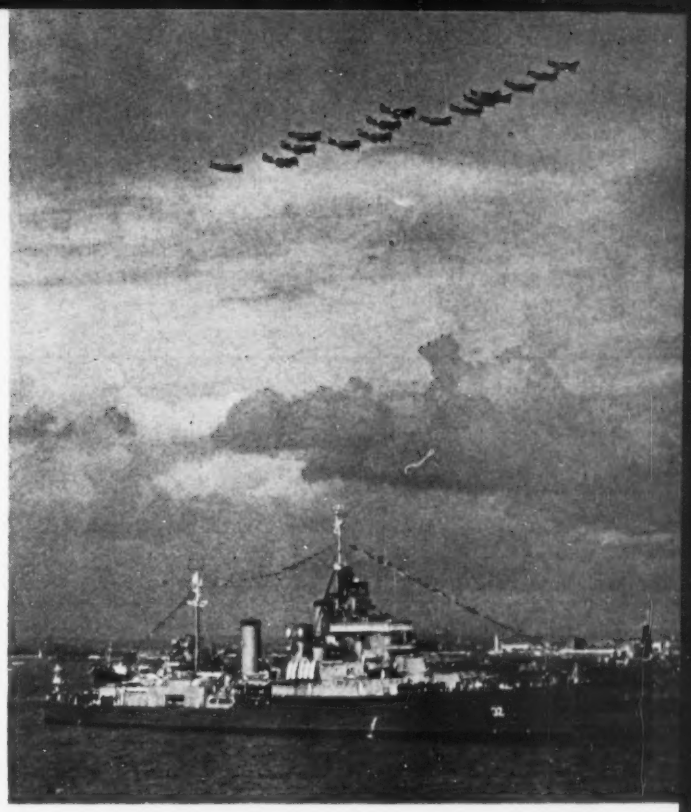
Slowly we approached H.M.S. *Vanguard*, and then turned to starboard down the line of carriers. The Russian *Sverdlov* and other foreign warships could be seen behind the high-sided *Eagle*, first of the British carriers.

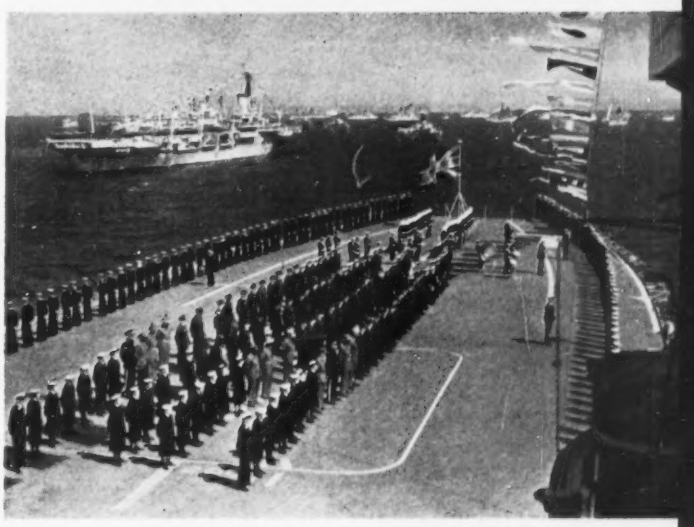
After passing *Indomitable*, *Implacable* and *Indefatigable*, and transferring a number of guests bound for *Illustrious* to that ship, we arrived at *Theseus*, which was to be our viewpoint for the review and fly-past. As usual, Fleet Air Arm hospitality to all on board was admirable. No aircraft were to be seen on the flight deck—nor indeed on those of the other carriers—but the Fireflies and Sea Furies of the ship's three squadrons, 820, 802 and 804, were to take part later that day in the main fly-past.

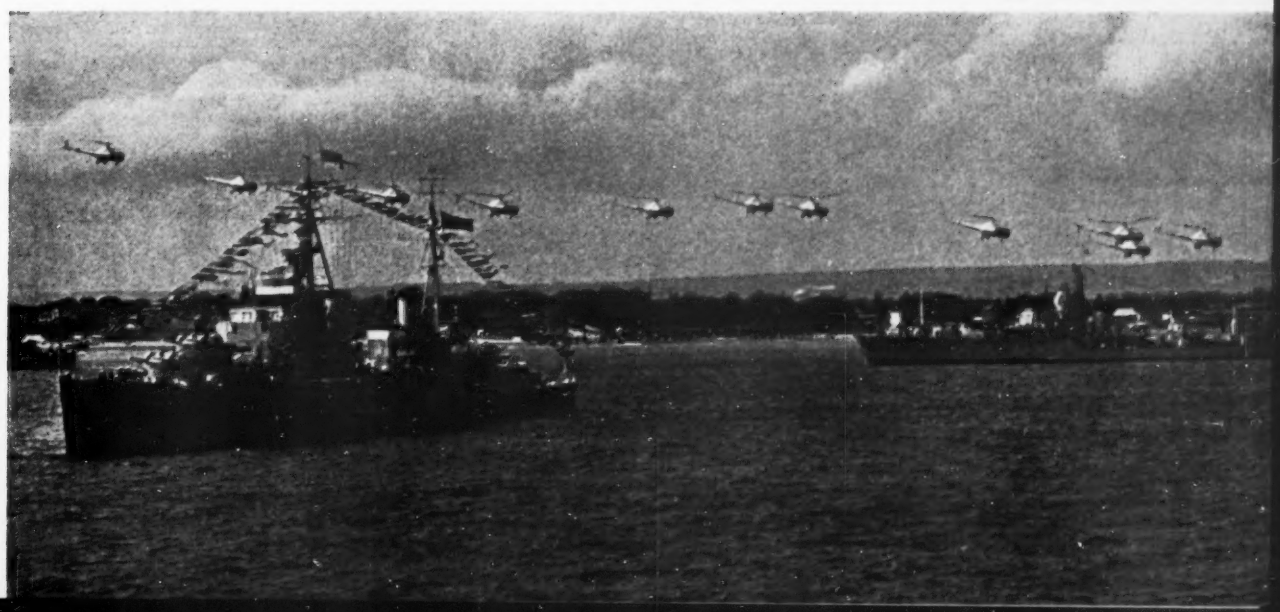
In command of the *Theseus* is Capt. D. McI. Russell, R.N., who has held this appointment since last December. An impressive sight is the battle-honours inscription on the quarter-deck recalling, among others, "Cadiz, 1797," and "Teneriffe, 1797," in which the first H.M.S. *Theseus*, a 74-gun ship, took part, and "Korea, 1950-51," referring to the present carrier, the third ship to bear the name. Since her Korean service, H.M.S. *Theseus* has served with both the Home and the Mediterranean Fleets. In November last year, Admiral of the Fleet H.R.H. the Duke of Edinburgh spent a day at sea in *Theseus* off Malta, the ship thus having the honour to be the first to wear his standard.

From the flag deck, the view was truly remarkable. Just opposite were the Dutch *Tromp* and, in sharp contrast to every other ship visible, the Italian training ship, *Amerigo Vespucci*, the sailing vessel that looks so much like our own *Victory*. Along the line from us were the other carriers; the Canadian *Magnificent*—khaki and blue ranks forming a human fringe to the flight deck, the Australian *Sydney*, and the *Perseus*. In a parallel line were the British, Canadian, New Zealand and Indian cruisers. The stiff breeze streamed and rippled the flags of each ship—dressed overall—including our own. On the flight deck of *Theseus* were paraded the ship's company, a number of R.A.F. officers from the Staff College, cadets, and a representative selection of the Commonwealth Coronation units. These included the Aden Levies, the King's African Rifles, the Royal West African Frontier Force, the Somaliland Scouts, the forces of Fiji and, startlingly prominent in white jackets and shorts and red pillbox hats, three members of the North Borneo Police.

Over the loudspeaker system came the news that the *Surprise*, acting as the Royal Yacht, was leaving harbour. The flag signal for the 21-gun salute and the salute itself were followed by instructions over the loudspeaker concerning the cheers to be given as the *Surprise* passed. With Naval exactitude came the warning "when

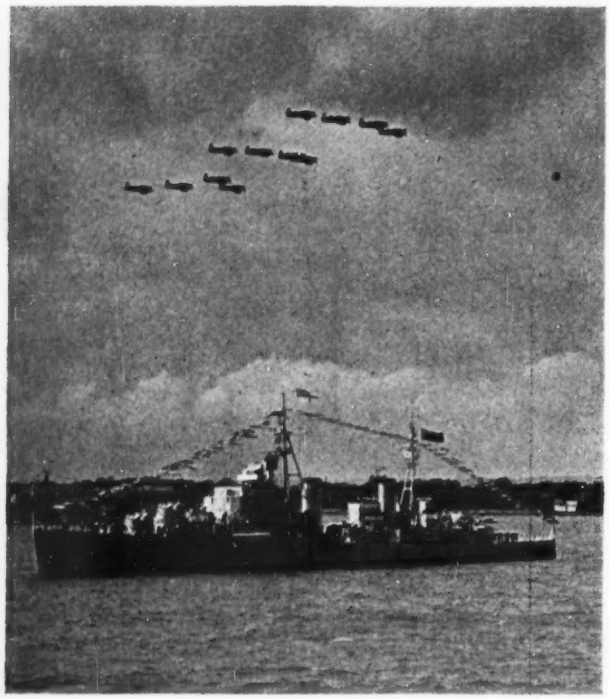




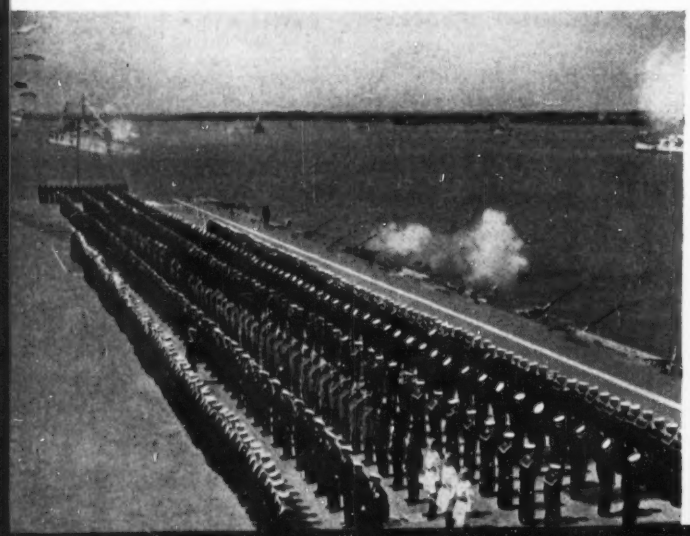


*(Below) The fly-past began with the appearance of S-51 Dragonflies of 705 Squadron, here passing over the line of British cruisers. (Right) The view from the flag deck of "Theseus" as the Royal Yacht, preceded by the "Patricia," approached. (Top, right) Two of the Firefly squadrons passing over one of the Canadian cruisers.*

*Fairey Firefly 7 anti-submarine aircraft of No. 719 Squadron alter course off the Isle of Wight to take up their review stations.*



*(Above) The Skyraiders of 849 Squadron, "guppy-tummies" visible, pass over the Fleet during the fly-past. (Below) The 21-gun salute is fired from H.M.S. "Theseus," in company with the other ships. On the flight deck, the ship's company, Commonwealth troops, and sea cadets stand to attention.*



## THE REVIEW OF THE FLEET . . .

raising your cap to cheer, do not seize it by the peak but by the crown . . . your arms should never come below 55 deg."

The order to "man ship" was given, and a single line of seamen formed along each side of the flight deck. The sun shone from a blue sky with patches of white cumulus, and silvered the gently rolling sea as the Royal Yacht began to pass along the line of carriers. The rigging of the *Amerigo Vespucci* became alive as numerous figures were seen clambering upwards to stand rigidly in line along the ship's yardarms—a neat and pleasant touch.

The yacht *Patricia* (with the Trinity House flag flying at the stern) then appeared, followed closely by the trim, light-grey *Surprise*. The Queen and the Duke of Edinburgh in front of the bridge were acknowledging the cheers from *Theseus*, cheers rapidly followed by those from the Dutch and Italian ships and the other carriers in turn. Following the Admiralty yacht *Redpole*, and the small ships carrying Admiralty guests, came the large, cream *Orcades*, the long, low *Pretoria Castle*, and the all-white *Strathnaver*, each carrying Government guests.

After the passing of the reviewing ships, there was a lull in the planned activity in *Theseus*. The flight deck parade was dismissed and, as the ship's band played light music, officers and men strolled at random over the flight deck, giving the atmosphere, if not the exact appearance, of a pleasant Sunday afternoon in the park.

At 1730 hours the fly-past began in a most unobtrusive manner, with the grey, glinting approach from the mainland of a dozen truly insect-like Dragonflies of 705 Squadron, preceding the lone Vampire flown by Rear-Admiral W. T. Couchman, D.S.O., O.B.E. Fireflies of 781 and 771 Squadrons flying at about 500ft and 200 kt were followed by the anti-submarine Fireflies of 15 other squadrons, including three R.N.V.R. and one R.A.N. Two squadrons of Seafires and the 849 Squadron Skyraiders preceded the Sea Furies of three Regular, three V.R. and one Canadian squadron. With heights staggered, the fly-past continued with the night fighter Sea Hornets and the anti-submarine Avengers. Four Wyverns of 813 Squadron were followed by two Fairey Gannets before the second main stream appeared. This consisted entirely of turbo-jet aircraft, led by the Vampires of 787 Squadron. The Meteor 7s of 759 came next, and then four squadrons, each of eight Attacker F.B.2s. Eight Sea Hawks of 806 Squadron followed, and then the impressive prototype flight of Sea Venoms, to conclude the Fleet Air Arm's own contribution to the Review.

From *Theseus* it was difficult to observe accurately the planform precision of the formations. The closely-spaced squadrons depended mainly on height separation to avoid slipstream interference, and in general the standard of flying appeared to be high. The weather was inclined to be rather bumpy, in spite of which the station-keeping of the Attacker, Skyraider and Sea Fury formations in particular was extremely precise. The remaining impressions were of the high speed, at a very low altitude, of the Sea Venoms, and the pleasing appearance of the Sea Hawks. K.T.O.

### The Scene from a Meteor

To take our allotted rear seat in a Gloster Meteor T.7 of No. 759 Squadron we reported at Royal Naval Air Station Ford (H.M.S. *Peregine*) at noon on the great day and were lucky enough to intercept the squadron's commanding officer, Lt. Cdr. D. R. O. Price, D.F.C., in the wardroom. A Meteor squadron being something of a Naval novelty, we elicited from him the explanation that the complete equipment included not only Meteors but Sea Vampires, Vampire Trainers (the first in Naval service) and Sea Fury Trainers also. The unit had lately started three-month conversion courses for Harvard-trained pilots. Later these aspirants would pass on to Attackers before joining operational jet-fighter squadrons.

Formerly 759 was responsible for the jet conversion of experienced piston-engined pilots. A continuing commitment—and a somewhat unusual one—is that of providing air armament experience for Naval officers taking the Long Gunnery Course at Whale Island. These officers themselves load the R.P.s and bombs, and otherwise become acquainted with air weapons before mounting to the back seats of Sea Furies to witness their delivery first hand.

For the Royal Review the squadron had loaned out two of its Sea Vampires to No. 787, but was itself obliged to other Fleet Air Arm units for a Meteor 7 or two to make up its prescribed total of eight.

We found 759 in company with the following units and elements of jet aircraft, and we list them in their fly-past order: eight Sea Vampires of 787 Squadron (astern of which the Meteors were to fly); eight Attackers from each of 736, 800, 803 and 890 Squadrons; eight Sea Hawks of 806; and four Sea Venoms flown by Boscombe Down pilots. One of the Sea Venoms had come off the line only three days previously.

The pre-flight briefing was taken by Ford's Commander (Air)—Cdr. M. Fell, D.S.O., D.S.C.—who had organized the entire jet participation. On Saturday's rehearsal (with which he had been

well pleased) he had flown one of the Sea Hawks in the tail-end of the formation "to see what it looked like"; but on The Day he was proposing to fly an Attacker of the "Spare Squadron." This was composed of a Vampire, a Meteor, four Attackers and two Sea Hawks, and its task was to fly astern of the main stream as far as St. Catherine's Point in readiness to replace any machine which might drop out.

The great briefing board was boldly inscribed in red, white and blue chalk "Coronation Review and Fly-past," and we read off the check points and times: "S/C [set course] 0 00; coast 1 42; Shanklin 4 30; St. Catherine's 5 42; Needles 8 06; Christchurch 9 30; Lyndhurst 11 57; Calshot 14 15." The customary good-natured leg-pulling was not absent, but there was unaffected earnestness in two brief sentences spoken by Cdr. Fell and which evidently made a deep impression on the assembled pilots. They were to this effect: "We trust that never again in your lifetimes will you fly in a Coronation Review. It's going to be bumpy; but grit your teeth and get there." And again, "Sweat a bit more and stay right in."

The aircraft would fly in "close-finger" formation, with flights and squadrons line-astern, the squadrons being stepped down and spaced at 150-yd intervals. Our own pilot was Lt. L. D. M. Searson, who was flying as "No. 4" to Lt. Cdr. Price; thus, we should be positioned on the starboard side of the formation and should have the best possible view.

Our departure from Ford was an experience in itself. The Sea Vampires were first on to the runway, where they halted at the 500-yd mark, while our Meteors, and the succeeding Attackers, Sea Hawks and Sea Venoms packed themselves in astern. In the lead was Lt. Cdr. S. G. Orr, D.S.C., A.F.C., officer commanding the Naval Air Fighting Development Unit at West Raynham. He alone was responsible for the timing and only he was authorized to use R/T. By this means he would announce "Vampire leader setting course" and would request landing instructions on return. The sun shone strongly through a patch of blue and the cockpit temperature mounted as we sat waiting and inhaling paraffin fumes. It was a relief—and a real thrill—to see the Vampires inch forward as the moment of departure came up on the stop watch, and on the split second go hareing up the runway. Then the first two Meteors of the formation arrowed away and in intimate company with our section-mate we ourselves were suddenly projected forward.

The air was, sure enough, bumpy; but in two wide orbits of Ford the sections and squadrons gradually knit themselves together into their sixty-strong armada. Of this, of course, we could see nothing, except in the steep turns. Distantly they appeared like swarming insects though the Meteors close on our left, patterned against the green of the sea as we swung steeply out over the coast, irresistibly reminded us of great silver fish. And let us here remark that, graceful and orderly as these jet formations may appear from the ground, they require intense concentration, and often exhausting physical labour, to maintain should conditions be other than perfect. For this reason Lt. Searson counted himself fortunate that our Meteor had spring-tab ailerons.

As we left Selsey Bill behind on our first leg we had a distant glimpse of the concourse of ships, shadowy grey in Spithead. Our course lay by way of Ventnor; round St. Catherine's Point, on the south coast of the Isle of Wight; skirting the shore and over The Needles; and across to meet the mainland again at Christchurch. There we changed course once more for Lyndhurst, and it was on this leg—the last before the final run-in—that the threatening rain-clouds took on an increasingly forbidding aspect. Suddenly we found ourselves confronted by the very Cyclops' eye, as it were, of a sullen black monster. Earlier, as we had orbited Ford, we had been obliged to cut through the tops of clouds; but this was something vastly more malignant, and the full significance of Cdr. Fell's remarks came home to us. In rain, bumps and blackness we *did* stick together (though at least one back-seat driver was very sorely tried), and at length we emerged into clearer skies to observe the great Fawley refinery with its flaming-torch stack as we thrust down over Calshot. We were on the run-in.

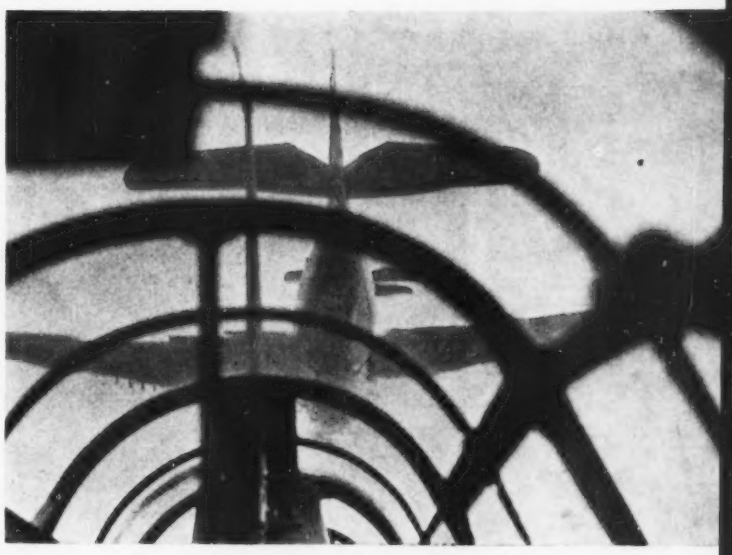
The spectacle now before us was one of incomparable majesty and strange beauty. Perhaps half the ships, towards the farthest end of the lines, were gleaming in a flood of sunlight; the rest lay in the dark grey shadows of the clouds. For some six miles (which with 300-odd knots on the clock, were covered in well under a minute) the lines of vessels, so varied in shape, size and nationality, streamed past on our right, till the lofty hulls of the carriers and the squatter mass of H.M.S. *Vanguard* proclaimed the imminence of H.M.S. *Surprise*. And there she lay, by *Vanguard*. We were dead on time.

In saluting their Queen at that historic instant the eyes of the pilots were only for their wing men, their hands urgently occupied with power and flying controls. They were saluting in the fashion of the Fleet Air Arm.

Our course now lay towards Selsey Bill and to our left we glimpsed the Gannets drawing away round the east coast of the Island. Next we spotted the Wyverns and, as we watched, the leading machine began to draw ahead of the rest. Its pilot, we knew, was Lt. Cdr. Laurie, the C.O. of 813 Squadron, and he was opening up the great Python turboprop and heading for Ford. There, together with Rear Admiral W. T. Couchman, D.S.O., O.B.E., Flag Officer Flying Training (who had led the whole fly-past in a Sea Vampire) and with the three senior jet-squadron commanders, he was to board a helicopter which would set him down aboard *Eagle*. Thence the party would transfer to *Surprise* to take sherry with Her Majesty.

Orbiting base, the rest of us were suddenly transformed into a group of vapour shimmies and at last in the clear again we broke formation with loads of g and relief. The runway ahead was crawling with jets, but we touched down in good order and taxied round the perimeter track as the Attackers, Sea Hawks and Sea Venoms came streaking low across the airfield for a stirring succession of lightning peel-offs.

It was good to be down again, and especially to hear that we had been bang-on time throughout. The crouching black cloud-beas had done its worst in vain. H.F.K.



*A singularly striking impression of Avengers of No. 815 Squadron, Royal Canadian Navy, pictured through the cockpit enclosure of a machine of the formation. The flight is described on page 769.*

*Clear of the dense storm-cloud, the fringes of which are much in evidence, surface craft and submarines lie arrayed on the dappled sea.*

# FIFTY YEARS OF FLYING

## —*Commemorated and Demonstrated at the R.Ae.S. Garden Party*

*The President of the Royal Aeronautical Society, Sir William Farren, and Miss Farren, greet the Paramount Chief of Ashanti and his party. (Right) S/L. G. Banner eases off the Blackburn monoplane at the start of his enterprising flight and, lower right, guests peer into the Avro 707B, forty years its junior.* "Flight" photographs

NO double-talk or back-handed compliment is intended when we state that one of the best things about the Royal Aeronautical Society's 1953 Garden Party was the souvenir programme. It commemorates fifty years of aviation history, recalling in scrap-book form many of the most notable occasions and achievements through the press-cuttings of the time. The first report is from the *Illustrated Sporting and Dramatic News* of July 4th, 1903, describing scientific kite-flying. Those concerned were Mr. S. F. Cody, Mr. Salmon, Mr. Brogden and Major Baden-Powell. The last-named was president of the Society at that time, and the report refers prematurely to the *Royal* Aeronautical Society when, in fact, this honour was not bestowed until 1919.

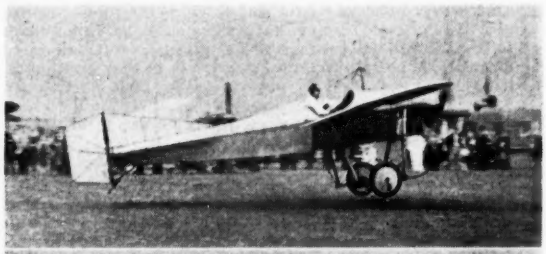
Aircraft taking part in the flying display were representative of the years recalled in the programme, and they provided just the practical reminder needed to recapture the spirit and changing atmosphere through the years.

Remarkable was the contrast, and astonishing were the indications of technical progress made in only fifty years. Who could have foreseen a machine such as the Victor in the days when great and excited crowds were being drawn to see the 1912 Blackburn monoplane, and the Deperdussin of even earlier vintage, making their halting ascents? Yet at Hatfield last Sunday all three were seen airborne over the airfield.

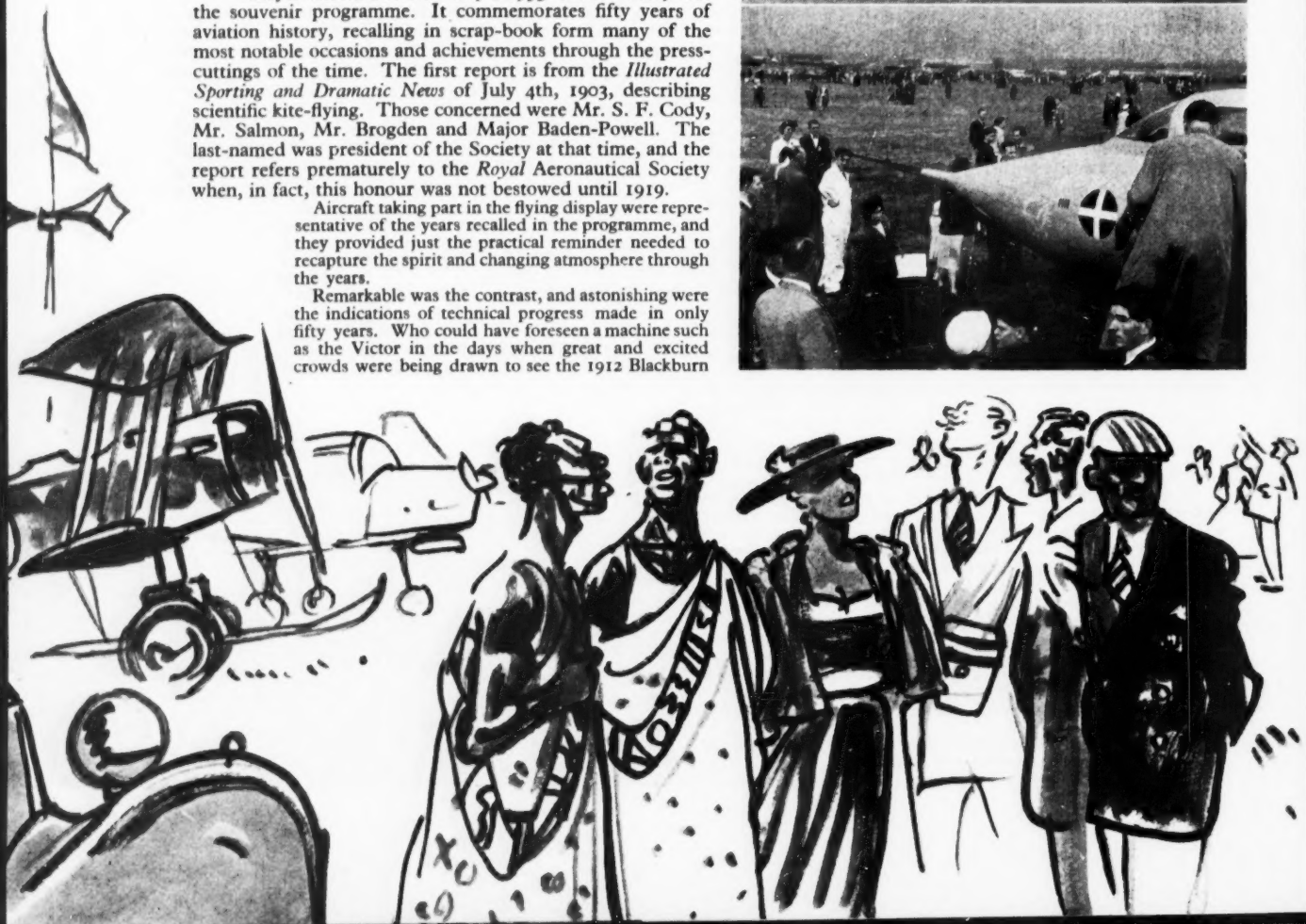
At 4.28 p.m. on the afternoon of June 14th, 1919, Alcock and Brown took off from St. Johns, Newfoundland, on their historic Atlantic flight, and the event of 34 years ago was recalled to the minute by the commentator.

For part of the time this 50th anniversary Garden Party was an umbrella-and-mackintosh affair, although the conditions were quite a lot better than the early depressing weather forecasts had indicated. An excellent attendance of over 5,000 members and guests (including a coachload of delegates from the I.C.A.O. Assembly at Brighton) rewarded the efforts of the president of the Society, Sir William Farren—who with his daughter received the guests; of the secretary, Dr. Ballantyne, and his staff, who organized the Garden Party; and of the O.C. Flying, Mr. C. A. Pike of the de Havilland Company (who had made their airfield available for the occasion). Mr. B. J. Hurren kept up a lively and informative commentary as the flying display proceeded.

Exhibits in the aircraft park were numerous; they offered variety in age, size and performance, and were both interesting







and instructive to guests regardless of their aeronautical knowledge.

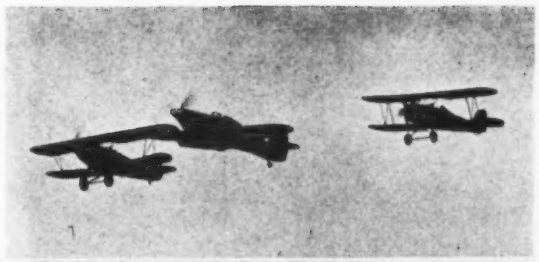
From the R. G. J. Nash collection of mechanical transport came a fine example of an Avro 504K, No. H2311, while the Shuttleworth collection provided the only and now well-known examples of the Blackburn 1912 monoplane (80 h.p. Le Rhône) and of the 1910 Deperdussin monoplane (28 h.p. Anzani Y). Also from the collection came the 1917 Bristol Fighter and a Sopwith Pup of 1916 vintage.

Another interesting little machine, and one of a number of vintage Hawker types at the Garden Party, was the little Cygnet which won the Air Ministry Light Aeroplane Competitions of 1924. The Hart, Tomtit and Hurricane trio were also prominent in their makers' blue and gold livery. The later metal construction, tricycle-undercarriage G.A.L. Cygnet was also present.

Specialists in contrast were the Avro company who, in addition to the 504K already referred to, had present their bright-blue delta 707B (VX 790), a Lincoln and a York. Examples of the Gloster company's contribution to aeronautical engineering were the well-preserved Gladiator, now registered G-AMRK (the owner is V. H. Bellamy of Flightways, Ltd.); the Science Museum's Gloster E.28/39 (which on May 15th, 1941, became the first British jet-propelled aircraft), and a Meteor N.F. 11 with belly and drop tanks, which, with the exception of its roundels, was painted matt black all over.

Pleasantly tracing the inter-war years of private flying were the de Havilland Cirrus Moth of 1925, Tiger Moth, Leopard Moth and Hornet Moth. In a different class was the D.H. Mosquito B-35 which carried a camera in its nose and an unexplained naval-looking radar nacelle beneath its fuselage.

Other sporting and light types to be seen—some on the ground, some in the air also—were Jean Batten's Percival Gull Six G-ADPR, Ron Paine's Miles Hawk Speed Six, a Mikron-powered Fairey Junior G-AMVP, and a B.A.C. Super Drone.



*Pausing before the Mosquito with camera and radar installed are Mr. George Edwards and family. (Top) Hawker pilots formate in the Hart, Hurricane and Tomtit. (Left) An all-black Meteor N.F.11 is lined up beside the Short Sealand and a York. (Lower left) The veritable Hucks, in this case of Ford and de Havilland construction. Beyond is the Gladiator.* "Flight" photographs

The American authorities had kindly agreed to provide a number of aircraft for the Garden Party, but unfortunately a decision had to be taken during the morning rain regarding jet participation in the flying display; and, as a result, Sabres and Thunderjets were withdrawn. However, many guests were most interested to see for the first time a Super-Dakota DC-3 in addition to a Beechcraft Expeditor, both from the U.S. Navy.

Captain Bissmarck of the Royal Swedish Air Force showed his Saab Safir.

Rotating wings brought a B.E.A. Bell 47B, a Naval S-51 and the Cierva C-30 Autogiro. Representatives from the glider world were a Meise from the Navy and a Slingsby Sky from the London Gliding Club.

In a marquee was a small but unusually interesting static display—mainly of engines. Veteran units included Rolls-Royce Eagle and R, Napier Lion and Sabre, Bristol Jupiter and de Havilland Gipsy 1. From even earlier years was a 60 h.p. Green engine which has actually flown 7,000 miles and is owned by S. F. L. Cody. Modern practice was exemplified by a Goblin 2, a Hercules and a working model of the coupled Proteus.

Two other intriguing pieces of machinery were available for

*An impressive low fly-past by the wide-spanning Elizabethan (Ambassador). (Upper right) A line-up of veteran warriors, Bristol Fighter nearest, Sopwith Pup, and Gloster Gladiator. (Right) Beside the Lincoln is a Super-Dakota of the U.S. Navy.* "Flight" photographs

## FIFTY YEARS OF FLYING . . .

examination. The first was the weathered Ibis (less its two 40 h.p. Salmson radials), designed by Bert Hinkler, built in 1931 and recently resurrected by Mr. Stisted of the Hampshire Aeroplane Club. The second was a well-preserved Hucks Starter based on a Model T Ford chassis, this example having been built by de Havillands in 1920

Two other items in the "static" marquee must be mentioned, the first a truly magnificent display of photographic enlargements, mainly from or of B.O.A.C. Comets. These, we feel sure, are the work of B.O.A.C.'s photographer, Mr. Hensser. The other was an exhibit of the Low Speed Aerodynamics Research Association. The radio-controlled model aircraft which they displayed has recently been fitted with a slow-burning solid-fuel rocket giving 4 lb thrust for 90 seconds. In fact, the rocket uses 63 Jetex slow-burning pellets—a somewhat expensive though convenient method of obtaining altitude. This glider-rocket combination has yet to be tried in the air.

### The Flying Display

The first performers were a Hawker trio—Neville Duke in the Tomtit, Bill Bedford in the Hart, and Frank Bullen in the famous Hurricane *Last of the Many*. The closeness of the formation as they passed very low over the crowd was, to say the least, moving. The Hurricane was seen to be keeping station with the aid of a fair quota of flap.

Even stronger in its nostalgic effect was the next item, which began with a Bristol Fighter and a Sopwith Pup being swung with the Hucks starter. A. Cdre. A. H. Wheeler, accompanied by a "gunner," was at the controls of the Brisfit, and W/C. R. F. Martin flew the Sopwith—and a very pretty and lively picture the two aircraft made, in formation or cavorting individually against the angry backcloth of the sky.

The Gloster Gladiator flown by V. H. Bellamy continued the proceedings, reminding one vividly (on take-off in particular) of the power which this, the last of the biplane fighters, used to employ to such good effect. How little space these old biplanes require to manœuvre and how sweet and quiet are their engines ! Next, more sedately, came a lighter elderly trio, D. H.Cirrus Moth (P. Fillingham up), Hawker Cygnet (Frank Murphy), and Blackburn B.2 trainer (Mr. Watson).

After this, powered-flight gave way for a spell to the silent simplicity of two sailplanes, the Slingsby Sky in the hands of G. H. Lee, and the Meise (D.F.S.) Olympia piloted by Lt. Cdr. Goodhart, R.N. The latter was taken to height by Miss Lettice Curtis, making her first glider-tow : Goodhart gave his usual faultless display of aerobatics, whilst Lee showed, among other things, how slow is the rate of descent of a high-performance sailplane.

Then the peaceful silence was broken by the crackle of the Genet-engined C.30 Autogiro, flown by Norman Hill. The machine gambolled around—not as impressively as the modern helicopter, maybe, but in a very lively manner for an important ancestor. It was followed by D. J. Masters in a civil-registered Fulmar, B. Radley in Jean Batten's Percival Gull Six, and R. L. C. Blyth in the noisy but practical D.H. Beaver. Then there were a couple of helicopters, an S-51 flown by Lt. Morton, R.N., and one of B.E.A.'s elegant two-seat Bells, piloted by 1st/Off. Crewdson. Last up before the heavier stuff was Ron Paine, in his attractively finished Miles Hawk Speed Six

The Mosquito B.35 flown by S/L. D. de Villiers started the military ball rolling, its pilot exhibiting an amusing propensity for appearing round the side of any convenient patch of trees. Six Meteors of 604 (R.Aux.A.F.) Squadron from North Weald were next overhead, when the weather was at its blackest, and these were followed by F/O. T. Glover in a Spitfire and F/L. W. N. Trimble in a Wellington. After them came a Canberra, flown by S/L. E. H. Turner; but he had clearly been briefed to keep his distance, and the demonstration must accordingly be described as sedate.

In place of the U.S.A.F. jets was a B.E.A. Elizabethan, huge yet elegant as it passed low before the spectators. And then there was an unrehearsed surprise. The Handley Page Victor could be seen in the distance, starting a local test-flight from Radlett, and to everyone's delight the pilot's course took him low across the edge of the airfield. Size may be deceptive, but the big machine seemed to be wasting precious little time. (Late in the evening, at St. Albans, the writer saw it again, this time with a Canberra tucked in behind it in tight formation—presumably taking ciné-photos.)

The three final turns provided a complete and culminating contrast. The 1912 Blackburn monoplane flew, first between the ranks of onlookers and then out into the middle of the field. S/L. G. Banner must have been airborne for at least 1,000 yd, which was a very fine effort : he even attempted a ten-foot zoom and a gentle turn, but this seemed to be asking rather too much, and a sudden and awkward return to earth resulted. Immediately afterwards the 1910 Deperdussin rose some inches into the air—not so readily, maybe, but still in a manner that was a fine tribute to so old a machine, and to the pilot, W/C. C. G. B. McClure. Finally, when these irreplaceable aircraft were once more at rest, the ultra-modern in the shape of Avro's delta-winged 707B took off—and left us wondering, after its demonstration, what the shape of aircraft will be after another 50 years of flight.

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## INDIAN AIRLINES NATIONALIZED

AS the outcome of India's Bill to nationalize her airlines, two corporations have been established, with effect from last Monday. The existing name "Air India International" will be applied to the new foreign-service organization, and the domestic-service corporation will be known as "Indian Airlines." The existing nine companies will receive £3½m in compensation.

## VISITING PARIS BY PROXY

IT now appears that British representation at the Paris Show is likely to be on a larger scale than at first thought likely. It is known, also, that France will probably show more than one aircraft of exceptional technical interest.

Comparatively few people other than those members of the industry directly concerned are likely to be in a position to pay a personal visit; to the rest, therefore, we venture to recommend perusal of the next three issues of *Flight*. Next week (June 26th) we shall be publishing a preview of the show; on July 3rd the outstanding features will be fully described; and on July 10th there will be a further report, discussing technical aspects, describing the static exhibits and individual aircraft demonstrations and —last but by no means least—telling the story of the great international flying display at Le Bourget.

We also plan to continue H. F. King's graphic story of his Korea trip (see pages 773-777 of this issue); and, of course, the show report numbers will be very fully illustrated with exclusive *Flight* photographs.

# BELGRADE JOURNEY

## *The Inaugural Flight of Eagle Aviation's Scheduled Service to Jugoslavia*

"EAGLE, Belgrade" was the illuminated inscription over desk 12 at the Waterloo Air Terminal on Saturday morning, June 6th. A harassed traffic manager was the only other sign that a new service was being inaugurated that day, in fact the first direct scheduled post-war flight between Britain and Jugoslavia. It was also the first scheduled service to be operated by Eagle Aviation, Ltd., the independent company, which has been granted a seven-year licence for the London-Belgrade route.

The aircraft used for the flight was Viking G-AKBH, *Sir Henry Morgan*, one of the ex-B.E.A. machines recently purchased by Eagle. Interior furnishings remain as in the Corporation's service (27 seats are fitted), while the external paint scheme has been slightly altered. Our crew was to comprise Capt. H. Watkins, 1st/Off. R. J. Cormican, Chief R/Off. P. H. Finnegan, R/Off. D. Denby, Eng/Off. R. Bennett and Stewardess Mary Tuffy. In addition to the number of passengers (British and Jugoslav), a quantity of mail and freight was carried.

At 10.15 the weather promised to be fine as the Viking rose from Blackbushe into a warm blue sky, cleared the London Control Zone, and set course for Munich at 9,500ft. Coastal cloud over Dover and Dunkirk preceded more scattered cumulus as Roubaix, the Ardennes, and Luxembourg passed below. The typical closely-striped curves of agricultural patchwork—slashed here and there by the NATO airstrips—then disappeared from view as we entered a forest of magnificent cloud formations.

As we crossed the Rhine, Stewardess Tuffy—an Australian, previously with T.A.A.—began to serve lunch. Normally, a crew of four will be carried; on this particular trip R/Off. Denby was receiving familiarization training as an additional crew-member.

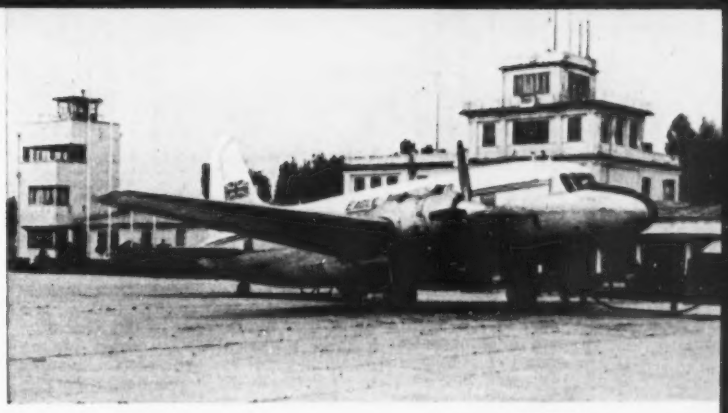
Munich was our mid-way stop, after three hours 12 minutes flying time. Here the refuelling and passenger-handling arrangements—a B.E.A. responsibility by contract with Eagle—were supervised by Mr. D. C. L. Oxley, the Corporation's station manager there. Passengers waited in the large, impressive, red stone terminal building as the aircraft chores were completed; a red Swiss Jungmann taxied in and out briskly to contrast with the Skymaster, Viking, Dakota and Convair movements of the big airlines, and at 1453 hr *Sir Henry Morgan* took off again, on what was, perhaps, the more interesting leg of its journey.

The white-topped Austrian Alps appeared as an imposing backcloth as we approached Salzburg at 11,500ft. Then we flew on towards Graz between a text-book selection of fascinating clouds above and the awesome close view of the mountains themselves below, including the 9,800ft peak of Mount Dachstein, to starboard.

A starboard turn at Graz pointed the aircraft towards Jugoslavia and the Zagreb beacon, after which came a turn to port and the final long straight leg to Belgrade. We passed over slightly hilly farmland and isolated communities, with here and there the colour-splash of newly-built houses and farm buildings, before the ground was masked by a thick layer of strato-cumulus, through which the let-down to Belgrade was made.

Final approach to Zemun airport was along the line of the Sava river, with the Danube—a muddy brown Danube—visible ahead of the city where both rivers join. The landing was made 2 hr 50 min after the take-off from Munich; a total of almost exactly 6 hr flying time from Blackbushe. Taxying-in, we passed several Dakotas of J.A.T., the Jugoslav national airline, parked alongside the perimeter track.

The return trip began the following morning, Sunday. With the Viking's relatively light load, the technical stop at Munich was deemed unnecessary and a non-stop flight plan was accordingly filed. Although Zemun is not primarily a military aerodrome, an amount of military activity does take place there; as *Sir Henry Morgan* was being refuelled, army parachutists were



*Four pictures of "Sir Henry Morgan", taken during the Belgrade journey. (Top to bottom) In front of the Zemun and Munich terminal buildings, being loaded with mail at Blackbushe, and as a background (at Blackbushe again, after the trip) to crew-members Finnegan, Watkins, Bennett, Tuffy, Denby and Cormican.*

## BELGRADE JOURNEY . . .

making practice drops (some with two chutes open per man) on to the aerodrome from Ju 52/3ms above. As we taxied out to the runway, we passed a picketed line of Jugoslav Air Force machines—none particularly modern; they included Ju 52s, Dakotas, Stearman 75s, Reliants, PO-2s and Yak 3s.

At 9.29 the runway controller's flag changed from blue to white, and the Viking accelerated forward and climbed to cross the Sava and to bank round over the outskirts of the city. Successive glimpses of a street market, bomb-damaged houses, domed churches, newly-built factories and the wide surrounding plain were our last views of Belgrade and Serbia before the grey haze isolated us once more from the ground.

The return flight was uneventful, but sufficed to prove that, even with the not-so-young Viking, the fastest and most comfortable way for tourist-class travellers to be transported across Europe is by air. Touchdown time at Blackbushe was 1505 hr, the direct return journey having taken 5 hours 36 minutes.

Impressions gained during a brief stay in a strange country are all-too-easily misleading, and following this short visit to the capital, it is not our intention to attempt to describe here the existing political and general conditions in Jugoslavia. What does seem clear, however, is that there must inevitably be an increase in the interchange of people and goods between Jugoslavia and other countries—and especially by air—if the country's present policy continues. In particular, increasing numbers of tourists should be attracted once more to the Dalmatian coast.

In the improved conditions and communications envisaged, the operations of Eagle Aviation, the chosen British company for the Britain-Jugoslavia air service, can do much good. With continued co-operation from the Jugoslav authorities, it is to be hoped that the expected traffic increase on the route will be soon achieved.

K.T.O.

# THE SKYLARK at LASHAM

## *New Slingsby Sailplane Undergoes its Handling Tests*

MENTIONED briefly in a recent issue of *Flight* was the appearance of the prototype Slingsby Skylark at Lasham over the Whitsun weekend. Since then we have been able to pay a visit to Lasham, to see the Skylark in the air and on the ground, and to speak with the pilots of the No. 1 B.G.A. Test Group who, with A.R.B. approval, are carrying out the flying tests on the new machine.

As *Flight's* Gemini approached the busy—yet beautifully silent—Lasham circuit, a light-coloured sailplane was performing with agility a series of rolls downwind of the airfield. This, in fact, proved to be the Skylark itself, with David Ince at the controls, and its smooth landing on the grass was followed by the somewhat noisier touchdown of the Gemini on the north-south Lasham runway.

Talking with David Ince and Frank Irving, we heard a promising account of the new sailplane's capabilities—in particular, of its remarkable rate of roll. In the tests at Lasham, pilots Ince, Irving, Lorne Welch, Hugh Kendall and Ann Douglas were investigating the handling qualities, rather than the performance characteristics, of the aircraft. Their report on the tests, which will probably be complete by the time this appears in print, will be submitted by the Slingsby company to the A.R.B. in their application for a Certificate of Airworthiness.

The angular lines of the Skylark's fuselage belie its high performance. Production models will have an oval-section fuselage and wider-span ailerons, and the nose-cap and upper part of the cockpit will be of moulded Fibreglass and Marco resin—a lightweight plastic material of considerable strength. At present the nose is plywood-covered. Aft of the cockpit and main bulkheads the fuselage consists of a fabric-covered diagonally braced wooden framework as far as the tailplane attachment frames. Tailplane and fin are plywood-covered, as is almost the entire area of the high-aspect-ratio wings. This resin-bonded waterproof wing-skin is attached to ribs of very accurate profile, and the overall wing surface is extremely smooth, assisting in preserving a laminar airflow over a high percentage of the chord.

The wing, of 45ft span, consists of a centre portion and two outboard sections, and in the centre portion are fitted scissor-type dive brakes which appear extremely effective. Assembly and dismantling are simple; the central mainplane is attached to the fuselage by two pins inserted horizontally from the front of the cockpit, and picking up the attachment fittings on the main bulkheads. Each centre section is attached to the central portion by two vertical pins.

**SLINGSBY TYPE 37 (SKYLARK)**

**Dimensions**

| | |
|---|---|
| Span | 45ft |
| Length | 20ft 11½in |
| Tare weight | 400 lb |
| Max. all-up weight | 620 lb |
| Wing area | 113 sq ft |
| Aspect ratio | 17.9:1 |
| Aileron area | 12.4 sq ft |
| Tailplane and elevator area | 17 sq ft |
| Fin and rudder area | 11 sq ft |

**Performance Data**

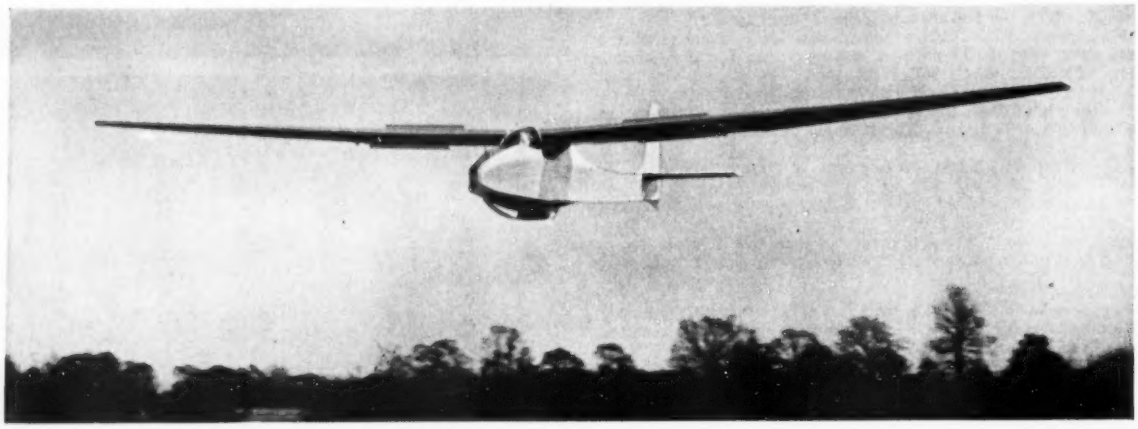
| | |
|---|---|
| Best gliding ratio | 1 in 27.3 at 46.3 m.p.h. |
| Min. sinking speed | 2.34ft/sec at 41.6 m.p.h. |
| Flying speed at 6ft/sec area | 74.5 m.p.h. |
| Min. speed | 37.4 m.p.h |

As part of the overall attempt to reduce manufacturing, and therefore selling, cost, Slingsbys have not fitted a landing wheel, though a jettisonable dolly can be supplied. The main skid is sprung with rubber shock-assorbers and is completely faired in, while the tail-skid design follows normal practice.

The removable canopy is fitted with a one-piece Perspex hood, providing first-rate visibility from the comfortable cockpit. The arrangement of flying controls is conventional, and the quick-release knob is located under the port side of the instrument panel. This operates the Ottfur safety-type towing release, situated about the centre of gravity, and which, as is generally known, automatically drops the cable should its angle to the aircraft become excessive during launching.

The dive-brake lever is on the port side, ahead of the seat (a

*Latest product from Slingsby Sailplanes, designers of the outstanding Sky, is the Skylark, a high-performance medium-span saiplane, here seen coming in to land after one of the early flight tests.*



# ejection seats . . .

During March 1953 over Chalgrove Aerodrome from a height of approximately 30,000 feet the Martin-Baker Patent Automatic Ejection Seat was successfully live tested.

Designed to reduce escape procedure to the minimum — once ejection is made the complete sequence of releases from the seat is automatic and no further action by the occupant is necessary.

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***Martin-Baker***

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*(The Old Boy's starting to get pompous, don't you think? Let's not listen . . . )*

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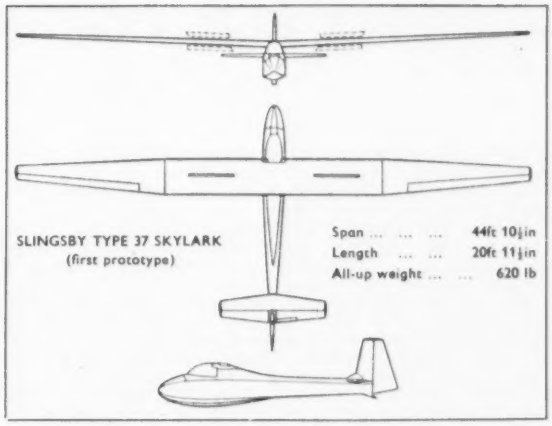
## THE SKYLARK AT LASHAM . . .

rearward movement of the lever extending the brakes) and the elevator trim control is on the starboard. Normal instruments consist of A.S.I., altimeter, electrical turn-and-slip indicator and Slater Cobb variometer, while special instruments can be fitted to suit individual requirements. Provision for the installation of a barograph is made in the fuselage neck, and access to the batteries for the turn-and-slip indicator is by the removal of the parachute box.

As the performance figures show, the Skylark is a relatively fast-flying sailplane. Price less instruments is expected to be under £700; this, together with its performance—high for a medium-span machine—and ease of assembly, should make it an attractive machine for club use. David Ince has been invited to fly the prototype in the National championships at Camphill, Derbyshire, later this year, but its appearance there obviously depends on (among other factors) the granting of its C. of A.

In the hangar at Lasham the prototype Skylark was parked near Philip Wills' world championship Sky: the future performance of the world-beating machine's smaller brother will be watched with interest—and not only by those in this country.




# CORRESPONDENCE

*The Editor of "Flight" does not hold himself responsible for the views expressed by correspondents in these columns; the names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.*

### Visible Supersonics?

YOUR practical and informative digest of a Cranfield report on the cause of "bangs" (*Flight*, June 5th) gives rise to the idea that if the pressure-rise of the supersonic wave in lb/sq ft is as great at low altitudes as estimated, then it ought to be possible to see the pattern in the wake of a fast aircraft (flying at say 1,000ft) as its supersonic wave hits the calm surface of a sea or lake below.

I believe the phenomena, if thus visible and photographed, would be a valuable contribution to the science of supersonic aeronautics.

A large number of outside factors associated with the aural safety of observers, etc, would clearly have to be taken into account, but if the idea is supported, I wonder who will be the first to bring back the facts in pictures?

Henleaze, Bristol. W. M. HAROLD.

### Television Interference from Aircraft

A BODY of opinion claims that what comes first should not be troubled by what comes after, thus: "cars were invented before TV, so let TV manufacturers find a method of filtering interference from the set." The fact that this is much more difficult than fitting suppressors to cars does not impress; it is a matter, not of cash, but of principle. Shortly before the Coronation, a local organization offered free suppressors to motorists, in the hope of stopping all interference; but, surprisingly, few took advantage of this. Actually, a lot of motorists who have TV sets do not fit suppressors, because they "don't use the car while watching TV."

I do not know the explanation of TV interference from aircraft, assuming it is caused by the signal reflected from the aircraft arriving out of phase with the direct transmission and so causing normal wave-interference patterns; if this idea is correct, the problem is part of the far more important one of trying to make aircraft invisible to radar. I am assured by an employee of Messrs. Pye (and it is also claimed in their leaflet) that the automatic picture control incorporated in the new Models V4 and V7 cuts out all interference from aircraft; nevertheless, hundreds of thousands of TV sets do not incorporate this device, and, in fact, I have seen a V4 which still gives some pulsation, although this set is newly installed and may not be properly adjusted.

The Ambassador, I believe, gives a lovely fat "blip" on a radar screen compared with a Canberra at a similar distance, while a Meteor gives a very small one. The wing of the Meteor is small, relatively, and broken by two large nacelles (perhaps these give most of the lift); and, although the Ambassador is larger than a Canberra, the latter with its much lower aspect-ratio makes a more compact "target." This might suggest that an aircraft with high aspect-ratio reflects radar better than one with low, but this aspect depends on the angle of the aircraft, so perhaps a delta aircraft will not give less interference. In fact, the area of a delta would seem to give a larger surface for reflection, and surface finish may to some extent affect the echo; but we will probably have to wait for the plastic aeroplane before we have the solution.

Cambridge PEDANTICA.

### No Inducement

A GREAT deal has been written, broadcast and televised on the necessity of encouraging youth into the aircraft industry. This is an obvious essential if Britain's lead in this direction is to be upheld. I feel, however, that the case is very much reversed when one reads through the "situation vacant" columns. A recent example was a firm requiring a man experienced on American engines, and offering a salary of £6 15s. per week. I hardly think it necessary to voice the obvious criticisms. At the other end of the scale, engineers with specialist degrees are required for senior posts, salaries ranging from £10 to £15 per week, dependent on experience.

In these days, with the ever-rising cost of living and the increasing complexity of modern aircraft, the result will, I fear, be a constant drift of the skilled men to other more remunerative industries and a steady decrease in trained young men to take their places.

I have been in the aeronautical engineering industry for sixteen years and, together with many others, feel reluctantly compelled to consider the prospects held by emigration or, alternatively, of changing over to a less interesting but more remunerative occupation.

Northampton. E. H. BAKER.

### IN BRIEF

MR. H. H. GRANT, of Chatham, Kent, writes to amend the final sentence of his letter, "Handley Page History," published on May 22nd. He now recalls that he saw a V/1500 flying low over Margate on March 17th, 1919. He adds that it was seen many times over Thanet, as it was stationed at Manston until the end of April of that year; on April 28th he saw it leave for the Continent.

### FORTHCOMING EVENTS

June 19. Institute of Navigation: "Accuracy of Wind Forecasts for Aviation," by C. S. Durst and D. G. Harley.
June 19-28. Zurich. British Chamber of Commerce "Made in England" Exhibition (including aviation).
June 20. "At Home": R.N. Air Station, Culdrose.
June 20. Society of Licensed Aircraft Engineers: Annual General Meeting.
June 20. Southend Corporation and R.Ae.C.: National Air Races, Southend Airport.
June 20-21. Aéro-Club de l'Ouest de la France: Anjou Wines Rally.
June 20-21. Aéro-Club de Flers de l'Orne: Normandie Rally.
June 21. Southern Aero Club: "At Home," Shoreham.
June 21. Aéro-Club des I.S.P.A.: Display, Marq-en-Bareuil, Lille.
June 26-July 5. Paris Aero Show.
June 26. College of Aeronautics, Cranfield: Presentation Day and Ball.
June 27. Official opening of Ramsgate Airport and Flying Club.
June 27. "At Home," R.N. Air Station Bramcote.
June 27. Aéro-Club d'Eure et Loire: Chartes Rally.
June 27-29. R.Ae.C.: Members' La Baule Rally.
June 27-30. Aéro-Club di Livorno: International Rally.
June 29. Combined R.Aux.A.F. Units: Ball.
June 30. Aircraft Recognition Society (Plymouth): "Twenty Questions" and Contests.
July 4. Cardiff Aeroplane Club: Display, Pengam Moors Airfield.

# TEST-BED CONTROL UNIT

## A New Teleflex Development

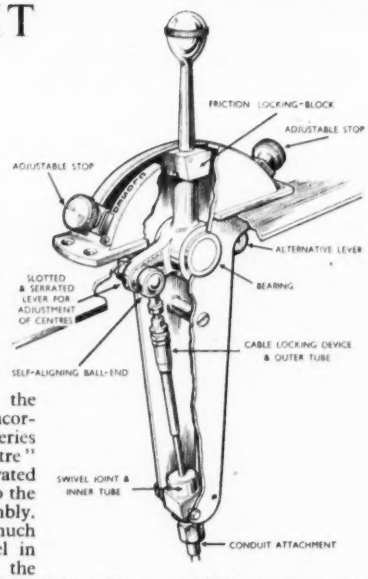
THE mechanical remote-control systems developed by Teleflex Products, Ltd., of Chadwell Heath, Essex, are well known. They are used not only in aircraft, but for a wide variety of applications in transport and industry.

A recent development is a control-desk lever unit for use in conjunction with Teleflex controls employed to provide connection between engine (piston-engine, turbojet, rocket-motor, etc.) test-beds and their associated control-rooms.

The accompanying cut-away drawing shows the construction of one of the units, which, being of compact design, can be mounted side-by-side in any required number to form a bank. A feature is a quick-release friction-locking device operated simply by a turn of the lever knob, and adjustable stops are provided at both ends of the quadrant. The extension of the unit underneath the control desk provides for attachment of the Teleflex control, together with the associated joints.

Control-travel can be reversed, if necessary, in relation to travel of the operating lever, and the linear travel of the control can be varied by means of slotted and serrated secondary levers. The standard collet device developed by the company for locking the end of the helical-wound Teleflex control to the operating unit provides a simple method of assembly which dispenses with the need for soldering or swaging. Control systems can thus be easily built up from the range of standard components, while an existing system can very quickly be re-arranged or adapted to another component. The system, therefore, is not only suitable for use on production-engine test-beds, where engine components are in a constant position, but, by the use of a variety of quickly detachable "break-down units" for quick dismantling of the controls at the engine, the system is equally suitable for use on development engines in which the disposition of components may vary from day to day. The layout can be arranged so that the main control from the operating unit is taken to some convenient point on the engine mounting and never disturbed, a short secondary control then being taken to the component on the engine.

One method of quick detachment is by means of a special keyed joint between two rod-ends attached to the ends of the main and secondary Teleflex, the rods being of the same outside diameter as the Teleflex and contained within a fitting which can be quickly split in half to allow disengagement of the keys, these keys being of such a form that both tension and compression effort can be transmitted without lost motion.




*This cut-away view shows the assembly of the control-desk unit.*

Another method favoured by certain engine manufacturers is to take the main control to a special unit arranged at a convenient point on the engine, this unit incorporating a second series of "adjustable-centre" levers slotted and serrated in a similar manner to the operating-lever assembly. This allows a very much greater range of travel in relation to that of the operating lever and, by suitable adjustment of the centres, very sensitive control can be obtained over a small lever-movement on the engine. Reversal of movement can also be obtained without disturbing the operating-unit assembly.

Another range of components is being specially developed for special requirements, e.g. traversing of pitots or thermocouples, etc., in jet-pipes; continuous sensitive control can be provided for up to 48 inches of travel in increments of one-eighth of an inch and recorded by a suitable indicator.

The control-desk lever quadrants which can be fitted with engraved plates to indicate any required notation or graduation, are well finished in black "crackle," with levers, etc., in chromium. Incidentally, the control-runs used with this system are of considerably larger diameter, i.e. 5/16in, than those usually employed in aircraft systems.

Teleflex Products, Ltd., have also produced, during the past few years, a variety of heavy-duty (up to four tons) control systems for various industrial applications, and certain of these are now being developed for special test-house applications.

# INDUSTRY IN BRIEF

Short Bros. and Harland, Ltd., are opening a London design office. This will be in addition to their London H.Q. at 17 Grosvenor Street, W.1, and will be in Ozonair House, Longmoore Street, Victoria, S.W.1.

* * *

J. M. George, an apprentice at Saunders-Roe Ltd., Cowes, has been awarded a Spitfire-Mitchell Memorial Fund Scholarship for a four-year aeronautical engineering course at Southampton University.

* * *

From N. C. Ashton, Ltd., St. Andrew's Road, Huddersfield, comes a data-sheet on the properties of Narglas "B", a creep- and scale-resistant copper-aluminium alloy of particular value for heat-exchanger tubes and certain gas-turbine applications.

* * *

By a recent agreement, Sealol Corporation (Providence, Rhode Island, U.S.A.) have exclusive licence to manufacture and market Flexibox mechanical seals in the U.S.A. and Canada, while Flexibox, Ltd. (Nash Road, Trafford Park, Manchester 17) have similar rights for Sealol seals in Great Britain, Northern Ireland, Eire and twelve Continental countries.

* * *

The most modern methods of preparing maps and plans from air photographs are described and illustrated with admirable clarity in *Mapping from Air Photographs*, a 32-page booklet published by Air Survey Co., Ltd., 24 Bruton Street, London W.1. The company is a Fairey subsidiary.

* * *

Oxygen sets used by the British Everest expedition while sleeping in tents were of the Siebe, Gorman type used for therapeutic purposes when required by invalid passengers travelling on B.O.A.C. Argonauts. The sets—a total of 20—were lent by B.O.A.C. To determine pressure and altitude in order to make the most efficient use of oxygen equipment, the expedition employed two Kelvin and Hughes KB 12/01 sensitive barometers.

* * *

Not one, but six, Rellumit filters of large capacity are installed in the Heenan and Froude Avon test-beds described in *Flight* of May 15th. These filters are made by Rellumit, Ltd., Chandos House, Palmer Street, London S.W.1.

* * *

Incorrect "matching" of spanners to nuts may result in danger to both the work and the operator. Jenks Brothers, Ltd., Bushbury, Wolverhampton, well known as makers of the "Britool" series of matched wrenches, have produced a most comprehensive wrench comparator chart covering 175 hexagon sizes for Unified, British, American and metric threads.

* * *

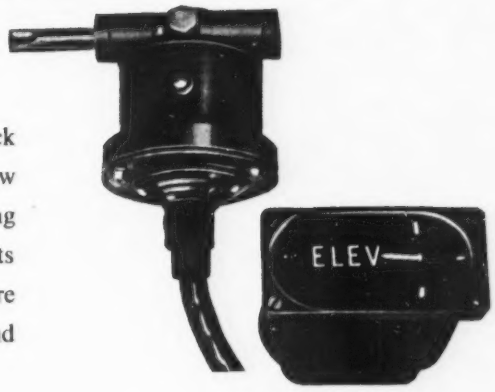
Barrier creams are now widely used for the protection of workers' hands, and the most effective and economical way of applying them is by means of a well-designed dispensing unit. Such units—standard models of 2½ and 4½ lb capacity, or special types to order—are described in a leaflet from Brightwell Dispensers, Ltd., Brithorn Works, Telscombe Cliffs, Newhaven, Sussex.

* * *

At the recent annual general meeting of the International Nickel Co. of Canada, Ltd., Mr. John F. Thompson (chairman) stated that the volume of high-nickel alloys supplied during the year by the company's English subsidiary, Henry Wiggin and Co., Ltd., was the highest ever recorded, with the Nimonic series, principally supplied for use by the aircraft industry, figuring prominently in the total.

# He was in Parliament Square (Cape Town) two days ago

The modern army officer makes full use of the quick transit afforded by air transport, but he may not know how much his flights depend on the perfect functioning of a host of instruments. Smiths, on whose products this great responsibility falls, take good care to ensure that the aviation industry gets the finest in design and performance.




A good example of Smiths' ingenuity is this new Linear Desynn Transmitter. Specially designed for use in restricted space, it is 4-oz. lighter, and smaller, than the existing Desynn Position Transmitter. The indicator can be supplied with single or double pointer. Electrical supply is 24-volt D.C.

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*Civil Aviation*

# PROBLEMS of a COLONIAL OPERATOR

## —*Outlined by Sir Hubert Walker, Chairman of West African Airways Corporation*

IN the ninth British Commonwealth and Empire lecture, read before the Royal Aeronautical Society on June 11th, Sir Hubert Walker, C.B.E., chairman of West African Airways Corporation, outlined the problems confronting the airline in "one of the last areas to be opened up to air transport."

Sir Hubert introduced his lecture by emphasizing that progress in British West Africa, for physical and financial reasons, had been slower than in most other parts of the Empire. The four territories dealt with in the lecture—Gambia, Sierre Leone, the Gold Coast and Nigeria—were each surrounded on the land side by the intervening French possessions. Total area of the British territories was 496,500 sq miles with combined populations of some 37m. The British territories, more densely populated than the adjoining French lands, were comparatively poor in terms of wealth per head; an indication of individual means was given by the current Nigerian Government budget—£47m from a population of some 30m.

The lecturer reviewed in some detail the developments leading up to the formation on May 16th, 1946, of West African Airways Corporation. At the same time, R.A.F. Transport Command withdrew its twice-weekly "bush service," which was open to the public on a circular route, based on Lagos, through Port Harcourt, Enugu, Jos and Kano. Until the Corporation began operating its own aircraft in November 1947 a replacement service had to be run by B.O.A.C. on a charter basis. Since 1947 local services, both first- and second-class, had gradually developed to a point where route mileage was 8,677, 43m passengers being flown annually; in addition, the B.O.A.C. links with London had been greatly improved. From the financial standpoint, however, internal traffic was small compared with external; B.O.A.C. carried 17,000 external passengers annually (nearly all to the U.K.) and the average fare paid by the internal passengers was about £10, compared with a little over £100 each by the external passengers.

Sir Hubert then discussed in detail the problems encountered by the Corporation since its inception, and these are summarized below under their respective headings.

**Aerodrome Siting.**—Some of the early airfield plans, the lecturer observed, "looked rather like a Union Jack" since the attention paid to cross-winds had resulted in recommendations for at least three, and sometimes more, runways. A decision had been taken in 1935, when Imperial Airways first proposed the service *via* Khartoum to Lagos and Accra, to adopt runways for the main terminals as opposed to area grounds. However, shortness of both time and funds led to the initial construction of one 1,000 yd runway extendable to 1,500 yd and a secondary runway of 800 yd. In the event, temperature and elevation reduced the need for cross runways and the third runway laid at Maiduguri, the only airfield so extended, rapidly became merely a taxi-track. The present day tendency, said Sir Hubert, was towards single-runway landing grounds.

**Runway Length.**—The original 1,000 yd runways had been extended by 200 yd, which proved adequate until 1941 when the R.A.F. opened its reinforcement route to the Middle East. The Colonial Public Works Department had in most cases experienced little difficulty in extending runways at the principal aerodromes, first to 1,800 yd and then 2,000 yd. Of 36 aerodromes built in British West Africa, only one in Nigeria and two in Sierre Leone had been abandoned as unsuitable and a further 10—built during the war for military purposes—were not yet regularly used, leaving 23 in regular use by scheduled services.

**Runway Bearing Strengths.**—It had not been possible to adopt standard U.K. practices. Before the war the funds available for airfield development were very limited and during the war cement and bituminous materials were very scarce. When the war ended such progress had been made with the knowledge of soils and the technique of use that the expense of concrete and macadam was not justified. The estimated cost of a new 9,000ft runway at Kano had been only £100,000, exclusive of the higher supervision and hire of plant.

**Communications, Weather and Control Facilities.**—With some difficulty obsolete communications and navigational aids had been replaced by new equipment. It was planned to instal long-range H.F. R/T. in place of the W.T. air guard in Nigeria. Existing 1 Kw beacons were being replaced by 100 watt beacons, at 12 aerodromes and V.H.F. R/T. was being installed at 15. Difficulty was experienced in recruiting substitutes for meteorological and control personnel withdrawn by the R.A.F. after the war, but this had now been overcome.

**Routes and Frequencies.**—After the war there were plenty of aerodromes and the problem was to select the best routes. It might have been thought that the best way would be just to connect the larger towns with low-frequency services and build up as traffic developed, but in practice this did not work out. Ibadan, for example, was by far the largest town in the area, with a population of over 500,000, but it produced only about a dozen passengers weekly. An early decision was taken to base the network of the local services on mails, which seemed the most reasonable way of ensuring the greatest benefit to the public. It followed also that the functions of the local services as feeders to the U.K. trunk routes would be provided for. From the mail viewpoint there were certain minimum frequencies below which there was no advantage in carriage by air, so initially a decision was made to begin with a frequency of three services weekly on the more important routes and those served by railways, and one weekly on the other routes. In practice it had been found that once a week was a bad frequency, twice a week was really the effective minimum, three times a week was quite satisfactory and six times was the ideal. To provide greater frequency for mail purposes, several of the initial services worked on a circular route, but this was not really satisfactory and the routes settled down to the familiar pattern of radiation from the main centres and returning by the same route. So much importance was attached to frequency of service that the Corporation accepted a general principle of operating a small aircraft up to six times weekly before changing over to the larger type.

**Aircraft.**—Three basic requirements were cited by Sir Hubert: all-metal construction, since wood and fabric had been found unsuitable for West African conditions; two engines, with a good single-engine performance; provision for a radio operator as well as the pilot. There was no reliable indication as to possible passenger loads. Mail amounted to the equivalent of only one or two passengers per service, so it was decided that eight-seater aircraft would meet the requirements of W.A.A.C.—at least for a few years. The shortness of stage-lengths (averaging about 150 miles equivalent to about an hour's flight by the type of aircraft likely to be suitable) caused the most perplexing problem. Sir Hubert paid tribute to the accuracy of an earlier Commonwealth lecture —that given by Mr Peter Masefield in 1948—which included charts showing the variation in hourly costs for different stage-lengths and rates of utilization. Such operating costs as were available for West Africa corresponded very closely with those quoted: for example, £45 hourly for a one-hour stage with a Dove utilized at a rate of 1,000 hr a year, and £33 hourly for a two-hour stage at the same utilization. With the present volume of traffic, the Corporation could do little to vary the stage-lengths, although it might later be possible to run separate stopping and through services on some routes; as regards utilization, it required a great deal of skill on the part of the operations staff to achieve 1,200 hours annually when flying was restricted to daylight hours, roughly between 8 a.m. and 6.30 p.m., six days a week.

The question was not, therefore, to select an aircraft which would operate at the most profit but rather that which would incur the least loss; the de Havilland Dove, ten of which were bought, was really the only possible choice.

Even in the Corporation's early days, the travelling public in West Africa were found to have a remarkably strong "four-engine" complex. The result was an order for six Marathon 18-seaters, this increase in capacity being considered the greatest that the traffic would stand. Unfortunately, delivery was not until 1952/53, so it was too early to comment on results, although in the first two months the Marathons' load factor had been over 50 per cent. The choice of Bristol 170s on the long Lagos-Dakar and Lagos-Khartoum routes was prompted by the fact that two Freighters were already operated under a management agreement and the M.C.A. was prepared to hire two Wayfarers on favourable terms; spares and engineers were available and capital expenditure was avoided, outweighing the disadvantages of slow cruising speed and high carrying-capacity for the traffic offering (which did not justify the frequency desirable).

**Staffing.**—Both the R.A.F. and B.O.A.C. were too busy during the war to train large numbers of Africans in maintenance work and general ground duties, as had been originally hoped. Consequently a large proportion of European staff had to be imported. To enable operations to begin, B.O.A.C. had seconded

*ON-THE-SPOT RADIO SERVICING: A new mobile radio servicing unit has recently been designed and built by Aer Lingus in order to facilitate aircraft turn-round at Dublin Airport. The vehicle, seen with one of the airline's four Wayfarers, contains batteries, test equipment and spares. It is expected to halve the time taken to perform routine daily inspections, and the saving during peak periods will be even greater.*

## CIVIL AVIATION . . .

some of their own staff and traffic officers. Progress had been made, however, with recruiting direct for the W.A.A.C. and only 40 out of a total strength of 221 were now seconded from B.O.A.C. But turnover of staff in West Africa was always high, an estimated annual replacement rate being about 12 per cent of the establishment. Quarters for European staff had involved an expenditure of £800,000, a heavy capital charge for a small undertaking. The African staff problem was one of selecting the most suitable of the many—too many for W.A.A.C.'s purposes—unskilled or partly trained personnel employed by B.O.A.C. during the war and of starting training schemes; the local establishment was now 876 of all grades. Progress in training engineers was slow but African traffic staffs were in charge at all but the five major stations. The West African governments were considering a scheme for training local pilots; the U.K. would provide initial basic training and subsequent experience would be given by the Corporation in West Africa.

**Workshops.**—In setting up the main engineering base at Accra in 1947, it was considered prudent to provide workshops, stores etc., to deal with twice the number of engines and aircraft contemplated (seven Doves and three Marathons). The requirements were thus estimated at: engine overhaul shop, 12,285 sq ft; propeller overhaul shop, 1,060 sq ft; component overhauls, 3,200 sq ft and stores, 4,800 sq ft. Engine, propeller and component overhaul areas had sufficed, in the latter case because large numbers of components were sent to the U.K. for overhaul. The stores area had been grossly under-estimated, however; a stock for 18-24 months had been found necessary instead of one for nine months, as planned.

**Passenger Accommodation.**—To provide stop-over facilities for government officers and commercial agents—who formed a large proportion of the passengers—standard-type rest-houses had to be built at main points on the W.A.A.C. routes. These comprise a dining-room and lounge block with separate blocks each containing two bedrooms and a bathroom, the numbers of which could be increased according to demand. This scheme had proved most successful and had been extended to other places where there were as yet no aerodromes; at some of the main stations the rest-houses were used by so many road and rail passengers that it had almost been forgotten that the air services were the original reason for their construction.

**Traffic.**—Although the number of passengers who paid the ordinary fare of 8d to 10d per mile was still increasing, and the lecturer felt it rash to prophesy, he suggested that in view of the comparatively small numbers of European and well-to-do Africans, saturation point might not be far away. Since 1949, Bristol 170s austerely equipped as 56-seaters had been carrying second-class traffic on short stages at fares initially fixed at 4d per passenger mile. A fifth machine had been bought to extend these services. There was a distinct tendency for passengers who would normally be expected to pay the ordinary fares to travel by these cheaper services, which, Sir Hubert indicated, might ultimately result in a single-class service at a rate slightly higher than the present second-class (4½d per mile)—say, 5d or 6d per mile. He quoted the following traffic figures over the past five years to illustrate the way in which second-class traffic has increased much more rapidly than either the internal or external first-class traffic:—

| | 1948-49 | 1949-50 | 1950-51 | 1951-52 |
|---|---|---|---|---|
| Internal 1st class ... | 13,813 | 14,538 | 24,872 | 30,346 |
| Internal 2nd class ... | — | 561 | 6,268 | 12,769 |
| External to U.K. ... | 7,928 | 11,299 | 15,711 | 17,269 |

**Re-equipment.**—Lately the increase in second-class traffic had been even more marked. It might prove necessary to use different types of aircraft for the two classes of travel because of the need to maintain frequencies on the first-class services. Because of the ever-increasing cost of aircraft, re-equipment was probably the biggest problem facing the small operators today. The cost of re-equipment every seven to ten years could not be met from ordinary depreciation and sinking funds, and much additional capital was necessary. The small operator with short routes could not always obtain the full utilization which was essential if the higher speeds of modern aircraft were to compensate for their additional cost. But he might be forced to re-equip with faster and more expensive aircraft if he were to maintain his traffic—if he could raise the necessary capital and face increased overall cost until utilization could be built up to match the higher speed. The travelling public was getting used to higher speeds on the main trunk lines and would expect at least a proportionate increase on the feeder services.

## NEW SERVICES APPROVED

THE Minister of Civil Aviation, after considering the recommendation of the Air Transport Advisory Council, has approved, subject to certain conditions being satisfied, the operation for a trial period of the following "coach" services to Central Africa:

(1) Services by Airwork, Ltd., and Hunting Air Transport, Ltd., on the route: London—Malta—N'dola—Lusaka—Salisbury, with technical stops at Nice, Mersa Matruh, Wadi Halfa—Khartoum, Juba, Entebbe and Tabora. (2) A service by the Central African Airways Corporation on the route: Salisbury—Lusaka—N'dola—Nairobi—Malta—London, with technical stops at Tabora, Juba, Khartoum, Luxor, Benghazi and Marseilles.

Very high load-factors have been a feature of the first colonial Coach service—the "Safari", jointly operated by Airwork and Hunting on the London-Nairobi route since June 14th last year. The two companies have also applied to operate similar services to West Africa and Malta.

## HUNTING SERVICES POSTPONED

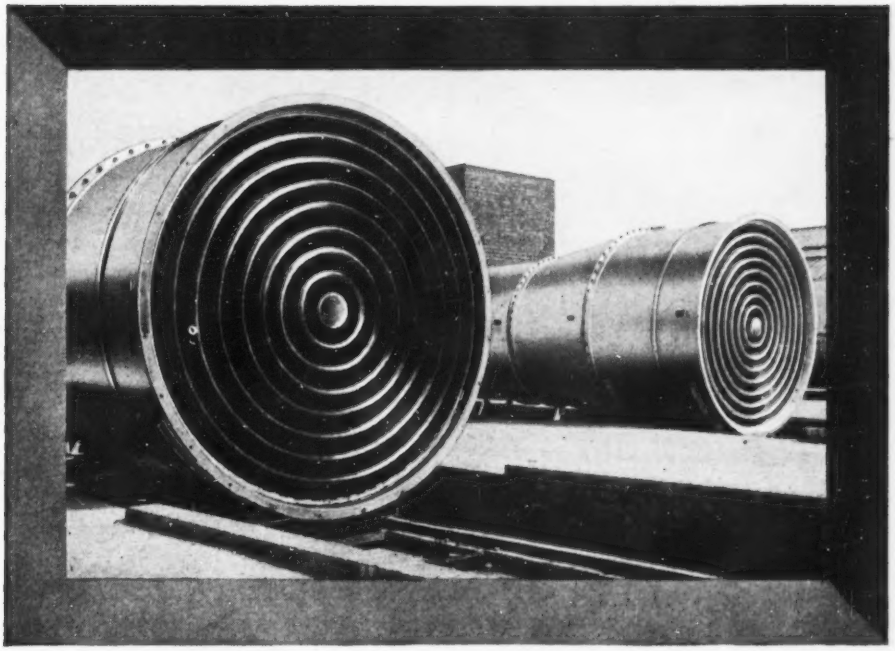
IT was announced by Hunting Air Transport last week that I.A.T.A. had withheld its approval of the tourist fares which the British independent company proposed to offer on new international routes linking Newcastle with Oslo, Stockholm, Copenhagen and Hamburg. As a result, Hunting decided to postpone the inauguration of these services, which was to have taken place on June 3rd. This is the first occasion on which serious difficulties have arisen at the I.A.T.A. level since the present Government's civil aviation policy, which provides independent airlines with greater opportunities to operate services on scheduled routes, was announced last year.

The necessary permission to run the Scandinavian services had been obtained from the governments concerned, following the M.C.A. announcement that the Minister had approved Hunting's application to operate them. One of the conditions of such approval, however, is that all fares shall be agreed to by I.A.T.A. In theory the power to approve fares is held by governments, but in practice I.A.T.A. has become established as the central and omnipotent rate-making body, and this is by far its most important function.

The Hunting statement says that the proposed fares were calculated to be in accordance with I.A.T.A. regulations and were in line with the general level of tourist fares introduced throughout Europe this summer. The rates for their new services to Paris, Basle, Amsterdam and Luxemburg were accepted, but S.A.S. objected that the fares to Hamburg and points in Scandinavia were below the level established by I.A.T.A. The comparatively small difference between, for example, Hunting's Newcastle-Stockholm single fare (£20) and the S.A.S. single fare on the Stockholm-Manchester route (£22 14s) suggests that the Hunting proposals were only slightly at variance with the internationally agreed level. However, differences of only a few shillings have been known to cause many hours of heated discussion during I.A.T.A.'s annual traffic conferences when these rates are established. Hunting's position in this matter is probably complicated by the fact that as a non-member it must approach I.A.T.A. through B.E.A.

Remarking that the company "had intended to offer to the public even lower fares," as being both economically possible and desirable in order to attract more traffic, the statement concludes that "Hunting Air Transport are naturally not prepared to inaugurate these services at inflated rates which bear little or no relation to the travel conditions and traffic potential over the routes concerned, and feel that they are serving the interests of the public better by reluctantly postponing their plans until more realistic fares are agreed."

*Photograph by courtesy of the de Havilland Engine Company Limited.*



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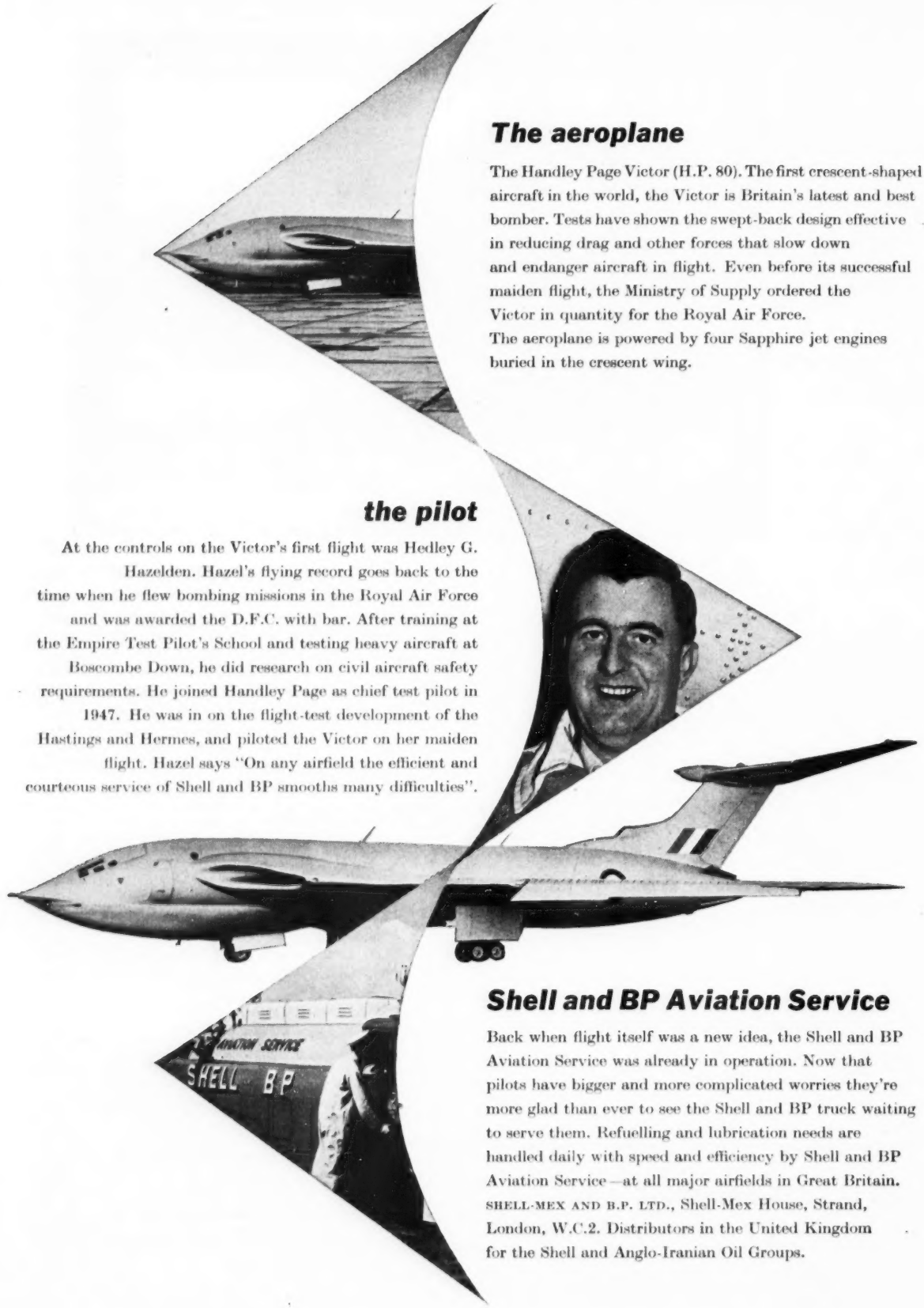


## The aeroplane

The Handley Page Victor (H.P. 80). The first crescent-shaped aircraft in the world, the Victor is Britain's latest and best bomber. Tests have shown the swept-back design effective in reducing drag and other forces that slow down and endanger aircraft in flight. Even before its successful maiden flight, the Ministry of Supply ordered the Victor in quantity for the Royal Air Force.
The aeroplane is powered by four Sapphire jet engines buried in the crescent wing.

## the pilot

At the controls on the Victor's first flight was Hedley G. Hazelden. Hazel's flying record goes back to the time when he flew bombing missions in the Royal Air Force and was awarded the D.F.C. with bar. After training at the Empire Test Pilot's School and testing heavy aircraft at Boscombe Down, he did research on civil aircraft safety requirements. He joined Handley Page as chief test pilot in 1947. He was in on the flight-test development of the Hastings and Hermes, and piloted the Victor on her maiden flight. Hazel says "On any airfield the efficient and courteous service of Shell and BP smooths many difficulties".

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CIVIL AVIATION...

# BREVITIES

ON Wednesday of last week, Air France took delivery of the first of their three Comet 1As. After a period of crew training, which will extend to the end of the summer, the airline will introduce Comet services on the routes from Paris to Cairo and Beirut.

* * *

Speakers at the tenth annual meeting of the Society of Licensed Aircraft Engineers will include Mr. J. D. Profumo, Parliamentary Secretary to the M.C.A., and Mr. E. D. Ayre, retiring chairman of the general council. The meeting will begin at 2 p.m. tomorrow (June 20th) in the Assembly Room, Manson House, 26 Portland Place, London, W.1.

* * *

Honduras became the sixtieth member of I.C.A.O. on June 6th.

* * *

The Leeds and Bradford Joint Aerodrome Committee decided recently to request the two city councils for authority to negotiate with the Air Ministry for the purchase of Yeadon aerodrome. Following the withdrawal of M.C.A. staff ast February, Lancashire Aircraft Corporation, on the expiration of their lease, also withdrew their staff and aircraft from Yeadon.

* * *

Cambrian Air Services have been operating since May 24th the first scheduled services ever flown between Wales and the West of England and the Continent. Doves operate three times weekly—on Wednesdays, Fridays and Sundays—between Cardiff, Bristol and Paris. Fares have been worked out on a "tourist" basis; for example, a single fare from Bristol to Paris is £8 1s and a twelve-month return ticket costs £14 10s.

B.O.A.C. announce the appointment of Mr. Michael Clapham as representative at Rome.

* * *

Three Douglas DC-6Bs have been ordered by Linea Aerea Nacional (Chile) for use on both internal and international routes.

* * *

T.C.A.'s district traffic and sales manager in London, Mr. J. D. Roberts, has recently been transferred to Montreal. He is succeeded by Mr. E. J. May, who was attached to the R.A.F. for five years during the war.

* * *

A merger application by the Flying Tiger Line and Slick Airways, America's two leading scheduled all-freight carriers, is due for a C.A.B. hearing this month. It is reported that a decision is likely to take at least six months. Both operators claim that their income from all-freight operations has had to be subsidized from other activities, such as the Korean airlift, but that together they would profitably carry 48 per cent of the domestic freight traffic, or "something like 100m ton/miles."

* * *

P.A.W.A. have set up a multi-purpose central reservations control unit at London Airport "to act as a co-ordinated European flight movement control with area dispatch, to maintain a wait-list record for the whole of Europe on westbound transatlantic flights, to move passengers to their destinations by the first available flight, re-routing when necessary, and to work closely with commissary to supply them with such information to have the correct number and type of meals aboard all aircraft."

# FROM THE CLUBS

FLYING time logged by members of the Elstree Flying Club during May totalled 228 hours. Commencing on Sunday next, June 21st, a monthly competition will be held to test members' flying and aircraft handling skill; details will be withheld until the pre-flight briefing. The following Sunday, June 28th, is the date arranged for Elstree's Afternoon Patrol; time, 1600-1630 hr; defended zone, 1-3 miles radius, 1,000-2,500ft height; prizes, the customary free teas. Combined with the patrol will be a spot-landing contest for pilots on arrival.

* * *

PANSHANGER has been announced as the base from which the national air touring competition on July 25th will be flown. Competing pilots must have at least 100 hours solo experience, and aircraft must be flown solo during the competition. Entry forms, obtainable from the Royal Aero Club, must be returned to the club not later than July 6th.

* * *

TO assist the chairman, Mr. G. H. M. Miles, S/L. B. H. Arkell has joined the staff of the Association of British Aero Clubs. The Association says that the duties of Miss E. Southern as secretary will continue unchanged, but with the growth of the organization the amount of detail technical work devolving upon the chairman has now proved greater than can be handled effectively on a part-time voluntary basis.

S/L. Arkell is a founder-member of the Helicopter Association of Great Britain, and he played an active part in its formation as a member of its council and Editor of its journal. From 1945 to 1951 he was engaged in test flying, first with Fairey Aviation and later with Bristol's.

* * *

DESPITE difficulties resulting from the closing-down of the Reserve Flying School, Fairoaks Aero Club will remain in business. The large hangar formerly used by the R.F.S. is being taken over by a local aircraft manufacturer, but the club will retain the hangar near the control tower. Part of this building has previously been occupied by R.F.S. Ansons, and extra space will thus be available to private owners. Flying training will continue to be given (in Magisters, Austers and Tiger Moths) under the C.F.I., W/C. C. F. Arthur.

LOBSTER teas are one of the afternoon attractions at the Southern Aero Club's "At Home" next Sunday, June 21st. The function commences with an arrival competition between noon and 1300 hr (featuring a sealed landing-time), while after lunch are planned spot landing, balloon bursting and flour bombing contests, and a *Concours d'Elegance* for visiting aircraft.

* * *

MEMBERS of the Airways Aero Club and the Sabena Flying Club were guests of the Air France Aero Club at Le Touquet over the weekend of June 5th-7th, in the first international airways clubs' rally. Fifty-four visitors, in some 20 aircraft, arrived for the occasion, and prizes were presented to winners of the various events by the Syndicat d'Initiative, the Hotels Association of Le Touquet, and the Aero Club of Le Touquet. Aircraft types included several Austers, the Tiger Moth, Stampe SV4, Norecrin, Aerocentre NC 853, Sipa, Monocoupe, Caudron Goeland, Argus, and the Saab Safir. On the Saturday, a lunch was given for the visitors at the airport restaurant by the Air France Club; guests of honour were Dr. Pouget, mayor of Le Touquet, M. Ziegler, director-general of Air France, and Mr. J. Lobley and Mr. I. Scott-Hill, of the Airways Aero Club.

* * *

RECENTLY published by the Popular Flying Association is *A Guide to Group and Ultra-Light Flying*, which gives comprehensive information on the association's activities, for members and others. The first part of the booklet refers to the problems of co-ownership groups, but includes also much of practical value to individual enthusiasts. The second part consists of a series of appendices, dealing with group formation, cost assessment and the design, operation and maintenance of light aircraft. The booklet, of undoubted value to all interested in low-cost light aircraft operation, is available at 2s 6d from Mr. Maurice Imray, secretary of the association, at Londonderry House, 19 Park Lane, London, W.1. (Regent 3050.)

* * *

ERRONEOUSLY announced, and quoted in our June 5th issue, was the name of the C.F.I. of the Ulster Flying Club. The C.F.I. is in fact W/C. C. W. Lindsay, A.F.C.; Mr. George Wynne-Eyton is assistant instructor and secretary.

*AIRWAYS ENTENTE: Cheery scene at the Le Touquet rally reported above. Mr. Morand, secretary of the Air France Aero Club, is presenting a bottle of champagne to M. Ziegler. On his right are Messrs. Lobley (B.O.A.C.) and Scott-Hill (of B.E.A., president and chairman of the Airways Aero Club). A Sipa, Aerocentre NC 853, Moth Minor and Tiger Moth form the background.*

# INQUEST on PRODUCTION

## *Select Committee on Estimates Reports on Gaps in the Aircraft Programme*

THE provision of aircraft for the Fleet Air Arm ranks high among the subjects which come in for criticism in the report of the Select Committee on Estimates,* published last week.

Members of the committee paid a visit to H.M.S. *Eagle*, and on other occasions interrogated a number of highly-placed officials, including Air Marshal Sir John Boothman, K.B.E., C.B., D.F.C., A.F.C., Controller of Supplies (Air); Vice-Admiral E. W. Anstice, C.B., the Fifth Sea Lord; Rear Admiral C. John, C.B., Vice-Controller (Air); Rear Admiral D. H. Hall-Thompson, deputy chief of supplies and transport; Mr. S. Scott-Hall, Director-General of Technical Development (Air), M.o.S.; Capt. A. S. Bolt, D.S.O., D.S.C., Director of Naval Air Warfare; and Capt. D. R. F. Campbell, D.S.C., Director of Naval Aircraft Development and Production.

As a result of these interrogations, the committee were made *au fait* with the large number of obsolescent types in service with the Navy today, and were given further information about five types now on order as replacements. Of these, says the Report, three—the Sea Hawk F.1, the Wyvern T.F.4, and the Sea Venom N.F. 20—had not been given super-priority because they had already reached that stage in their development, beyond which no advantage would be gained by so doing. They were due off the lines in satisfactory numbers in the near future. Delay in production of the Wyvern had been very considerable, it was admitted: there had been "surging" troubles with the Python engine, and difficulties with its contra-rotating airscrews, but all these had now been cured. The final production order was given in January 1951, and some machines were expected to be in service this year. It was denied that serious delays had been caused by the Admiralty requesting modifications, and the machine was claimed to be immensely superior to its predecessor, the Firebrand.

The Naval aircraft to which super-priority had been given were the Gannet, and a new twin-jet swept-wing fighter to which reference was made in the Navy Estimates of March 16th [this is thought to be a development of the Supermarine 508, with swept wings and conventional tailplane—ED.]. Progress with the Gannet since the allocation of super-priority had been up to schedule.

The delay between the starting of a requirement for a new aircraft and its introduction into operational service was stated to vary between 7½ and 10 years. For this reason the Admiralty had now decided to follow the example of the Air Ministry, and order "off the drawing board" rather than wait for a prototype to prove itself. This change in policy was welcomed by the committee. It was agreed that the Fleet Air Arm would not be satisfactorily equipped with up-to-date aircraft until 1956, but by then equipment should be superior to that of the U.S. Navy. "It was," says the Report, quoting Sir John Boothman, "the usual leap-frogging business all over again."

Turning to the supply of aircraft to the Royal Air Force, the Report says that the committee had paid a visit to the Handley Page works at Cricklewood and Radlett, and had also interrogated Sir John Boothman, Sir Folliott Sandford, K.B.E., C.M.G. (Deputy Under-Secretary of State for Air), and others. The cuts in Canberra production were discussed, and the opinion given that overseas sales to offset these cuts would not come from the M.S.A., but only by "going out and getting them." Curtailment of Canberra—and Meteor—production had not facilitated provision of the all-important and expensive electronics for the V-bombers, as the requirements were different for the later aircraft. Steps had been taken, however, to obtain pre-production sets for the first Valiants, and ordinary production was going quite well. A point about the Vulcan and Victor was that the change-over from production of Canberras to these V-bombers may very likely result in a production gap at the Avro and Handley Page factories.

The point had been made by Sir Frederick Handley Page that the tremendous cost of modern aircraft could be greatly reduced if a manufacturer were given sufficient orders in the first instance to justify his incurring the outlay required for fitting a production line with jigs and tools in appropriate numbers for economical production. But, commented the committee, the present economic situation seemed to prevent the Ministry of Supply from giving initial orders in such quantities as would fulfil these requirements.

The committee also recommended that the Ministries of Defence and Supply, and the Service Departments, should examine the possibility of greater co-operation between the Western Allies so that each country could produce at a reduced cost per aircraft a more limited range but greater numbers of specialized machines for the benefit of all the Allies—provided that the proper balance of aircraft manufactured in this country was fully maintained.

*"*Seventh Report from the Select Committee on Estimates (together with the minutes of evidence taken before sub-committee B, and appendices), Session 1952-1953—Rearmament." H. M. Stationary Office, price 7s 6d.*

## RIGHT-HAND MAN

FROM Vickers-Armstrongs, Ltd., comes the news that Mr. E. B. Trubshaw has been appointed deputy chief test pilot at Weybridge. Brian Trubshaw joined Vickers-Armstrongs in May 1950 and has since been concerned with the test flying of the Valiant and Viscount. In 1949 he was on the staff of the Empire Flying School, Hullavington, and later was engaged on staff duties at the R.A.F. Flying School at Manby, Lincs. From 1946 to 1948 he was a pilot of the King's Flight, and he flew one of the Vikings used by the Royal Family on their tour of South Africa in 1947.

*Mr. Brian Trubshaw.*

Born in 1924, he was educated at Winchester, where, in 1942, he was captain of cricket. He maintained his enthusiasm for the game after leaving school, and played for the Royal Air Force from 1946 to 1949.

## SWEDISH DESIGNER HONOURED

A REPORT from Sweden records that Mr. Curt Nicolin, vice-president of Svenska Turbinfabriks ab Ljungström (STAL), was recently presented with the Thulin medal for his achievements in the design and production of jet engines. The presentation was made by the C-in-C. of the Royal Swedish Air Force, Lt. Gen. Bengt Nordenskiöld, at the 20th annual meeting of the Swedish Society of Aeronautics. Mr. Nicolin has been responsible for the Dovern and Glan engines, two recent designs produced by the STAL organization.

## H.D.A. APPOINTMENTS

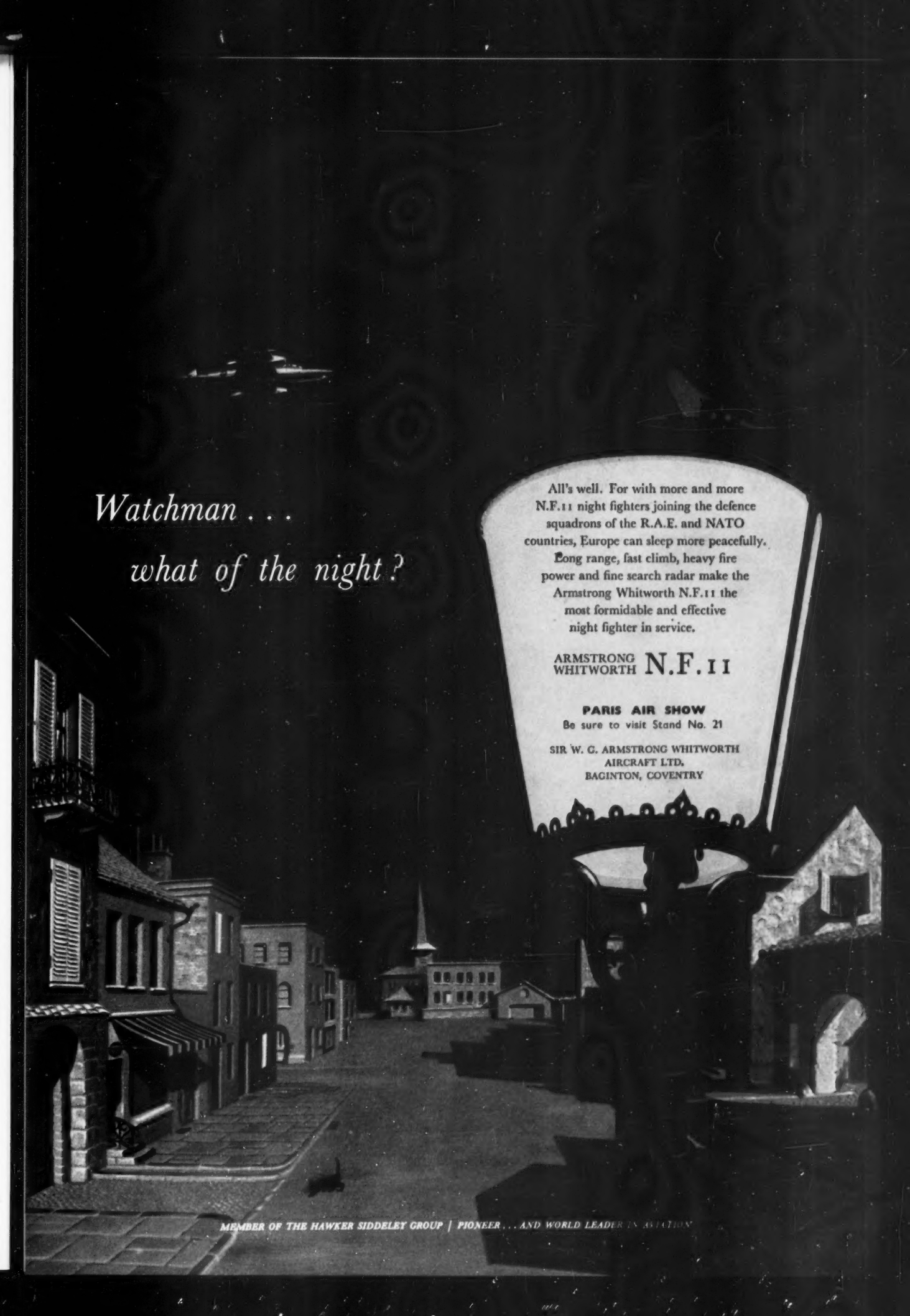
TWO new appointments have recently been made to the Board of High Duty Alloys, Ltd., of Slough. The new directors are Mr. W. Scott Warner and Mr. Gerald W. Richards.

*Mr. W. S. Warner.*

*Mr. G. W. Richards.*

Mr. Warner joined the staff as assistant chief accountant in 1940 and in 1946 was appointed secretary, a position which he will retain in his new appointment. Mr. Warner serves on three committees, the F.B.I. Southern Regional Council, the F.B.I. Overseas Trade Policy Committee and the Wrought Aluminium Products Executive Committee.

Mr. Richards, since he joined the company in 1929 as a laboratory assistant, has been concerned mainly with the production side of the forging plant and is a well-known personality in the National Association of Drop Forgers and Stampers. When the company's Redditch works started production in 1939 he was posted there, made assistant works manager in 1941, works manager in 1943 and manager of the forgings division in 1948.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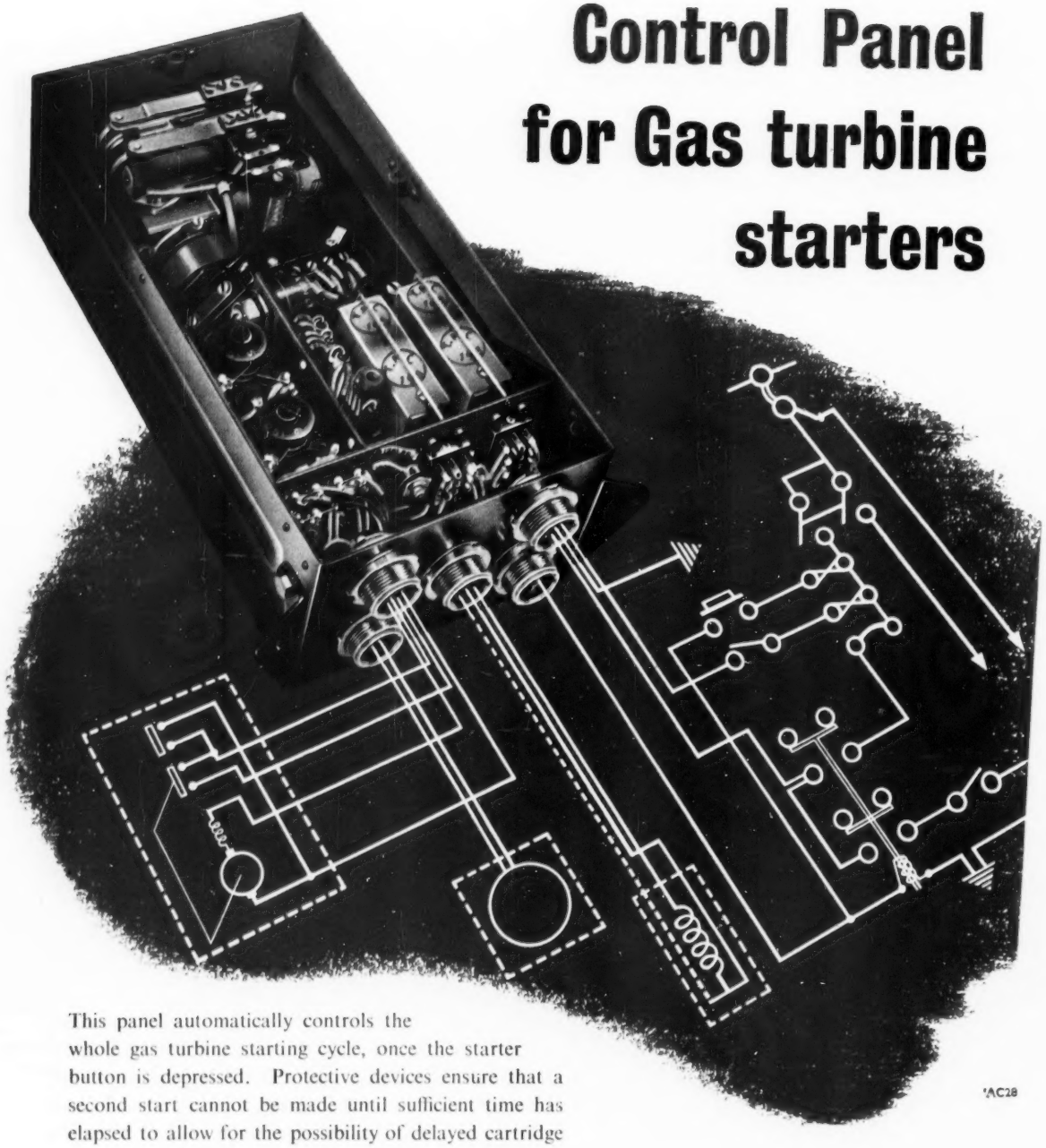
# Control Panel for Gas turbine starters



This panel automatically controls the whole gas turbine starting cycle, once the starter button is depressed. Protective devices ensure that a second start cannot be made until sufficient time has elapsed to allow for the possibility of delayed cartridge ignition. The panel also protects the turbine starter by preventing it from firing while the engine is rotating faster than the safe starting speed.

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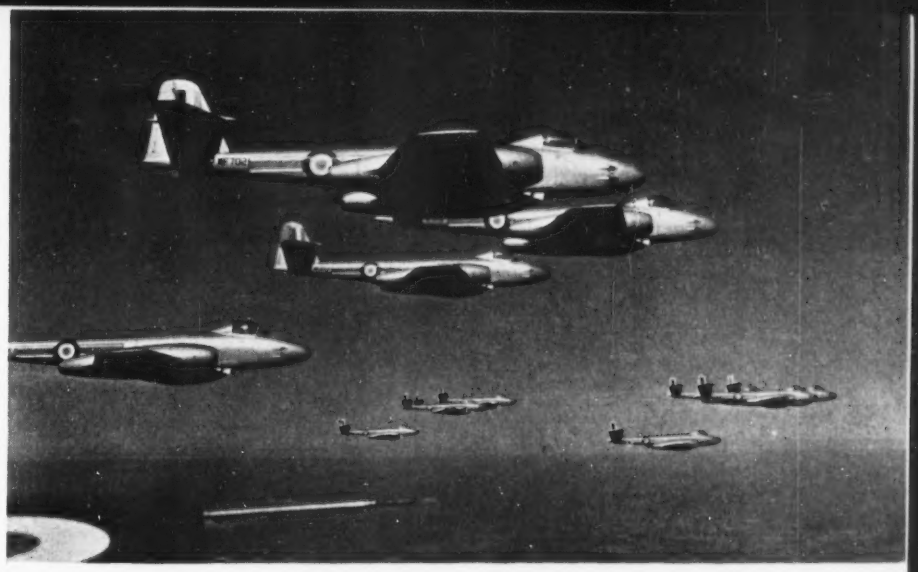
# SERVICE AVIATION

*Royal Air Force and Fleet Air Arm News*



*IN THE BLUE: A striking photograph, by Russell Adams, of the Meteor 8s of No. 41 Squadron, led by the commanding officer, S/L. Miller, D.F.C.*

## R.A.F.A. Conference

THE Winter Gardens hall at Bournemouth was the venue for this year's conference of the Royal Air Forces Association. In the chair for the first time was Marshal of the Royal Air Force Lord Tedder, the newly appointed president. He succeeds the late Sir Richard Peck, to whose memory several of the speakers paid tribute.

The programme opened with an address of welcome from the Mayor of Bournemouth, and the "Silent Tribute" to fallen men was conducted by the Rev. A. L. E. Williams, the Mayor's chaplain. At the end of the tribute the chaplain recited Laurence Binyon's words "They shall grow not old as we who are left grow old . . .", the final words "We shall remember them" being repeated by the assembled company.

The declaration of Lord Tedder's election as president was read by Air Marshal Sir Robert H. M. S. Saundby, chairman of the national council; it was received with applause by the delegates and evident embarrassment by the officer concerned.

Messages were read from the Queen, the Duchess of Gloucester, Lord Trenchard and Lady Peck, these being but a selection from a whole sheaf of greetings.

Before leaving, the Mayor drew the ballot to decide which branch should appoint two members to represent the Association as bearers of the wreath at the London Cenotaph remembrance service. The honour went to Milford Haven.

Sir Robert Saundby then gave a *resumé* of the annual report, which was issued in booklet form. Some figures from this report appeared in *Flight* of April 10th.

Preliminaries ended, the business of the conference started. Lord Tedder lit his pipe, retired behind the smoke screen thereof, and called for resolution No. 1. This demanded that the association should press forward with the British Legion in the demand for an increase in the disability pension to at least £4 10s per week for 100 per cent disability. The resolution was very ably put by the delegate for Downpatrick, who said that although such resolutions might be thought of as useless trumpetings he would ask the delegates to remember the walls of Jericho. The resolution was carried.

In the welfare section a resolution put forward by the Belgian branch was debated at length. This asked the conference to view with concern the rule of the Imperial War Graves Commission that British ex-Servicemen who die abroad cannot be buried in British Military cemetaries. A delegate spoke against the burial of civilians in cemetaries designed for those who fell in battle; but the resolution was carried.

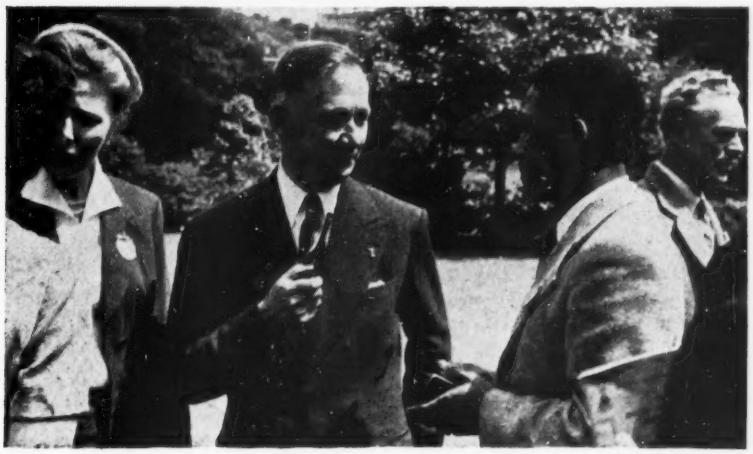
In the last period of the first morning session, matters dealing with the annual conference and national council were discussed. Concern was shown at the small proportion of branches sending delegates —only about 340 out of a total of some 750. Actually, at this conference there was a higher proportional representation from overseas branches than from the home areas, but this was probably due to the effects of the £1,000 hospitality scheme to enable representatives from abroad to come to Britain for the Coronation.

Much of the remainder of the conference dealt with domestic matters. The financial aspect was put very clearly and patiently by the honorary treasurer, Mr. F. W. Lindgren. In common with other such organizations the R.A.F.A. is having a difficult period, but its basic finances are still very sound. All branches are expected to pay their way as best they can, and this sound outlook was reflected in the loss of a resolution (by Merthyr Tydfil) calling for a reduction from five to two per cent in the charge on loans to branches for the purchase of furniture and equipment.

Sunday's programme opened with a memorial service at the War Memorial, Central Gardens. The delegates marched on with banners flying—a very impressive sight, especially when these were gently dipped to the drum roll during the "Remembrance." The service was conducted by the Rev. A. S. Giles, the newly appointed Chaplain-in-Chief to the R.A.F.

Back in the Winter Gardens, after the service, the various trophies were presented. The Shell Mex Membership Trophy went to the Northern Ireland Area; the Gwynne-Vaughan Wings Day Trophy for the highest average collection per member (£9 18s 8d) was won by Clifton and Duncairn Branch; and the Battle of Britain Trophy went to the Stansted Branch (for collecting £147 9s 10d with a membership of only 21). The Overseas Membership Trophy was won by the Nigeria Branch.

The resolutions discussed during the session dealt with *Air Mail*, the R.A.F. Benevolent Fund, Wings Day and Battle of Britain Week, and were all largely of a domestic nature. The final item on the agenda, the ballot for the venue for next year's conference, resulted in Scarborough being chosen.



"Flight" photograph

*AT BOURNEMOUTH: Marshal of the R.A.F. Lord Tedder and Lady Tedder, with the overseas delegates to the R.A.F.A. conference held last weekend. The Marshal is chatting with Mr. I. B. Browne, the delegate from the Antigua branch, which has a membership of five.*

## S/L. J. Lomas

WE regret to record the death, in an accident to a Meteor near Middlesbrough last Saturday, of S/L. J. Lomas, D.F.C., A.F.C. and Bar. S/L. Lomas will be remembered as the pilot of a Meteor 4 which, in November, 1947, flew from Edinburgh to Bovingdon, Herts, at an average speed of nearly 620 m.p.h. His war-flying career, notably as a night-fighter pilot, had been a distinguished one. The other occupant of the Meteor, F/L. B. N. Hanratty, also lost his life.

## SERVICE AVIATION . . .

### Birthday Fly-past Curtailed

BAD weather severely interfered with the Canberra fly-past over London in honour of the Queen's official birthday on June 11th. The original intention was that 36 Canberras from Binbrook, Hemswell and Scampton should participate, and should fly from Lincolnshire *via* Colchester, Folkestone and Dungeness to Bexhill, where the final straight leg over Biggin Hill and across the Mall would commence.

Widespread rain and low cloud forced the abandonment of this plan. Only the Binbrook Canberras—numbering 24—were to fly, and their route was an emergency western one by way of Oxford and Beachy Head. Following the take-off, eight aircraft lost contact and were diverted; the remaining 16 found slightly better visibility over Oxfordshire but conditions worsened again at the South Coast.

Within 25 seconds of the scheduled time the formation—four flights each of four machines—passed over the Mall in front of Buckingham Palace. Poor visibility and bumpy air were obviously being encountered. On the return, the weather at Binbrook caused the formation, led by G/C. N. C. Hyde, C.B.E., to be diverted to bases at Valley, St. Eval and Lyneham.

### Policy Appointment

UNTIL recently Deputy Chief of Staff (Operations) at H.Q. Allied Air Forces Central Europe, and previously to that A.O.C. No. 11 Group, Fighter Command, A.V-M. T. G. Pike, C.B., C.B.E., D.F.C., has now been appointed Assistant Chief of Air Staff (Policy).

A.V-M. Pike will be remembered by many for his skill at night interceptions while commanding No. 219 Squadron in 1941. It was for this work that he won the D.F.C. and Bar.

While serving in the Middle East and N. Africa he took command of No. 1 Mobile Operation Room Unit and later gave up this post on being appointed Senior Air Staff Officer to the Desert Air Force.

*CANBERRA COURIERS: The men who flew the Coronation telerecordings across the Atlantic on June 2nd. (Left to right) S/L. W. N. Kenyon, S/L. H. J. Shield, D.F.C., F/L. F. Garside, F/L. N. E. Metcalfe, F/L. S. P. Gulyas, R.C.A.F., F/L. R. F. Hiller, and F/Os. J. W. Crompton and R. G. Reeve, who constituted the reserve crew.*

### Tickets for Odiham

ADMITTANCE to Odiham for the R.A.F. Coronation Review is by ticket only. These will shortly be on sale at all the usual agencies, price 1s 6d each. Some 25,000 will be available but, because of the absence of rising ground in the public enclosure, only 8,000 to 10,000 of this number of holders will be able to witness the ground events. All, of course, will see the fly-past.

Windscreen labels are necessary for those coming by road. These cost 2s 6d for cars and 5s for coaches.

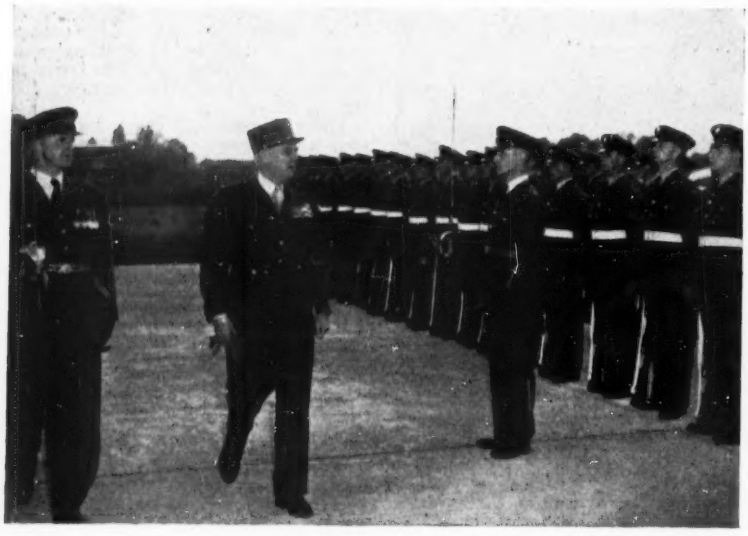
Publication of the official programme has been entrusted to the R.A.F. Benevolent Fund. The Fund has spent no less than £166,308 in helping 6,152 cases during the first three months of this year.

### R.Aux.A.F. Appointment

THE Air Ministry has announced the appointment of S/L. N. G. Townsend, D.F.C. to command No. 502 (Ulster) Squadron, R.Aux.A.F., which is based at R.A.F. Station Aldergrove, Co. Antrim.

S/L. Townsend is a regular officer who, from October 1951 until his present appointment, was Adjutant of No. 612 (County of Aberdeen) Squadron, R.Aux.A.F. During the war he completed two tours of operations and, in 1946, received the Air Efficiency Award.

*ALLIED VISITOR: Marshal Juin, C-in-C. NATO Forces in Central Europe, inspects the R.A.F. Guard of Honour at Wahn Airfield, Germany, during his recent visit to the British Forces in that area.*



### Malayan Operations

THE improvement in conditions in Malaya last month was reflected in the small demand for offensive air support. For the first time since the emergency began there was a period of over 14 days on which no offensive sorties were flown.

Most of the offensive effort for May was made in support of Operation Commodore, the big air and ground effort during the latter half of the month in an attempt to eliminate the Johore State committee of the Malay Races' Liberation Army—thought to be in the target area, near Kluang.

The exact rendezvous was not known, but two sites were considered as probable. Over 60 sorties were undertaken during the first 24 hours and a feature of the attack was the dropping of 4,000-lb "cookies" by the Lincolns of No. 1 Squadron, R.A.A.F. For the same operation a Valetta dropped 20 paratroops in the Kluang area.

Helicopters of No. 194 Squadron R.A.F. and No. 848 Squadron R.N. together lifted 39 casualties from jungle clearings and, in addition, No. 848 alone carried 2,000 troops and 5,000 lb of freight, including a mortar with 200 bombs. The "loud hailer" Valetta operated throughout the month.

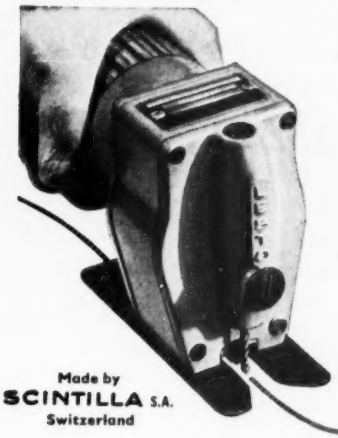
### R.C.A.F. Europe Appointment

THE appointment has been made of G/C. R. S. Turnbull, D.F.C., A.F.C., D.F.M., R.C.A.F., to command the Canadian No. 4 Fighter Wing at Baden-Sollingen in Germany. He is at present station commander of R.C.A.F. Station Saskatoon and will take up his new post in July.

The squadrons coming under his command will be No. 414 from Bagotville, No. 422 from Uplands and No. 444 from St. Hubert. G/C. E. H. Evans will take over G/C. Turnbull's post at Saskatoon.

### R.A.F. versus Pakistan

A CRICKET match will be played on June 20th, 22nd and 23rd at the Hawker sports ground, Richmond Road, Kingston-on-Thames, between the R.A.F. and Pakistan. The proceeds will go to the R.A.F. Benevolent Fund, and the band of the R.A.F. will play during the tea intervals. The R.A.F. XI will include F. S. Trueman (England and Yorkshire), S/L. Shirreff (Cambridge and Hampshire), S/L. Wilson (Kent), the Rev. Paton (Cambridge and Notts), F/O. Fenner (Kent), and A/C. Thompson (Warwickshire). The Pakistan XI will include six men who have already played for their country, and the team will, in fact, be the nucleus of the 1954 touring side. Among their players will be Fazal Mahmood, a very fast bowler.



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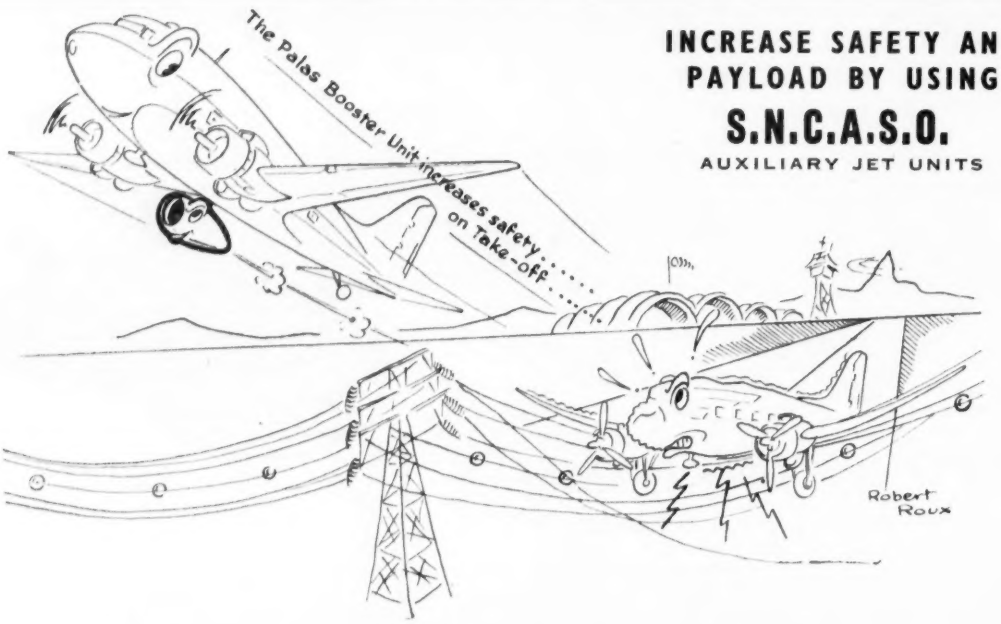


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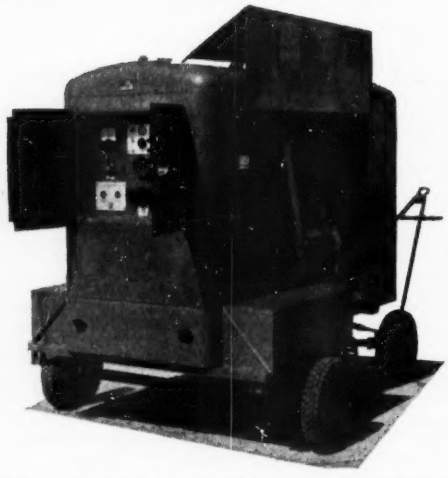

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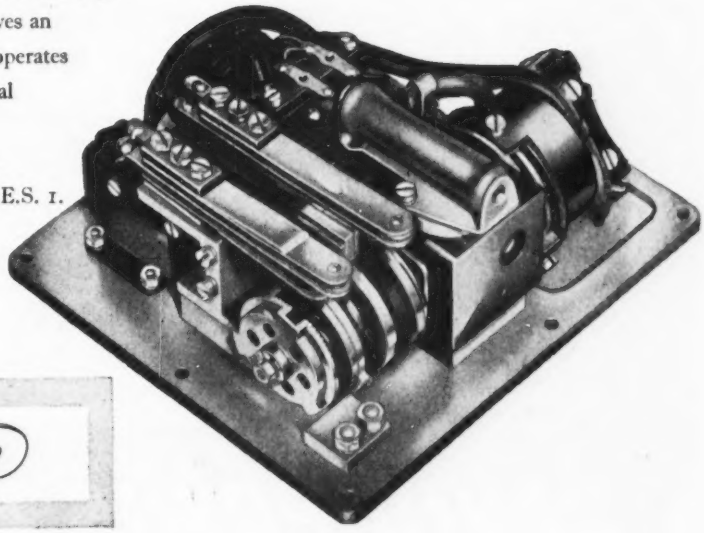

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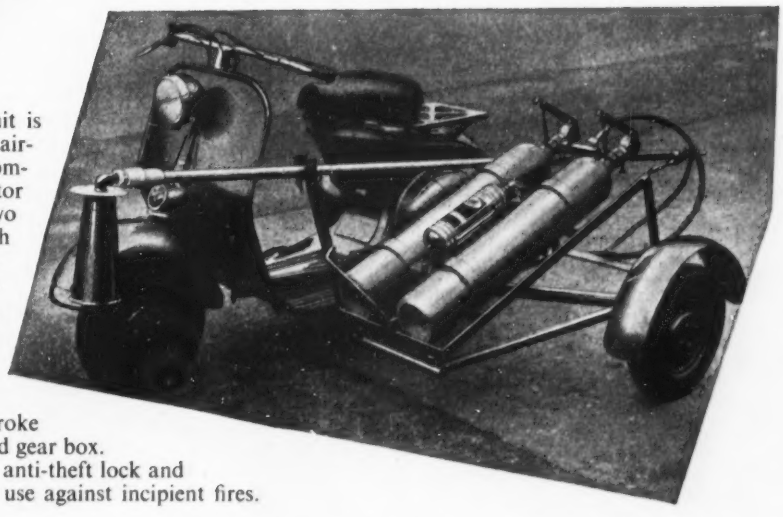

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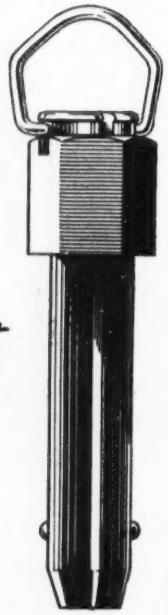

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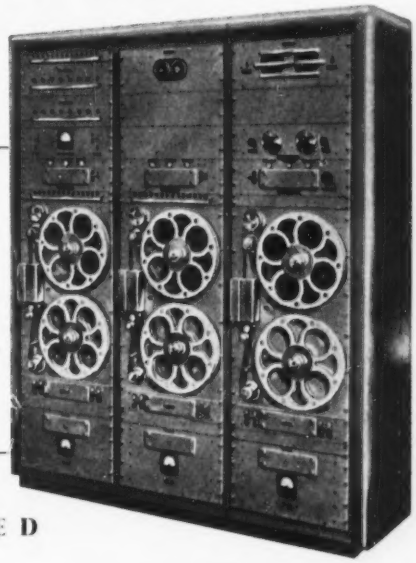

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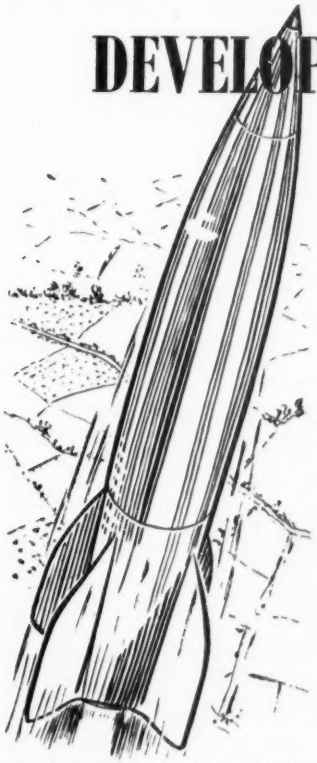

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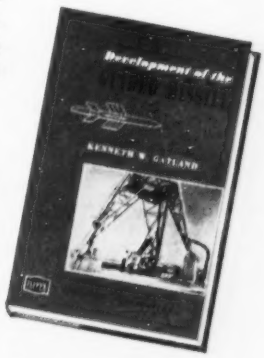


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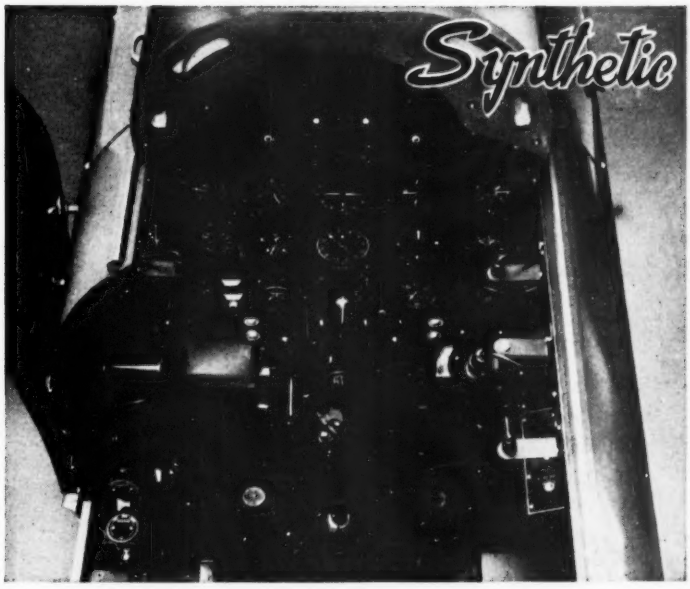


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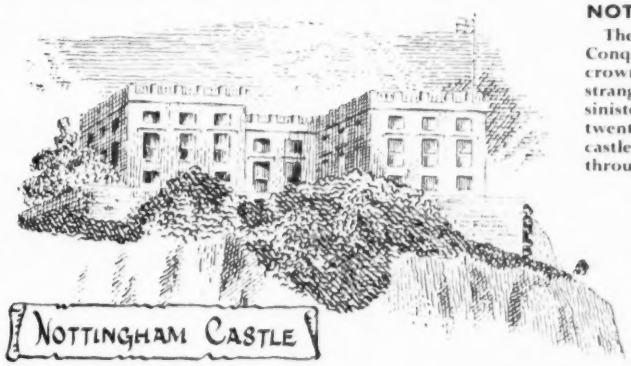


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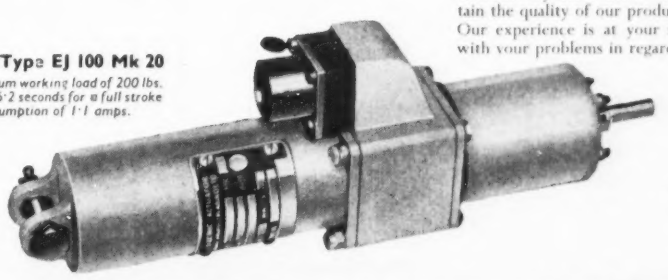

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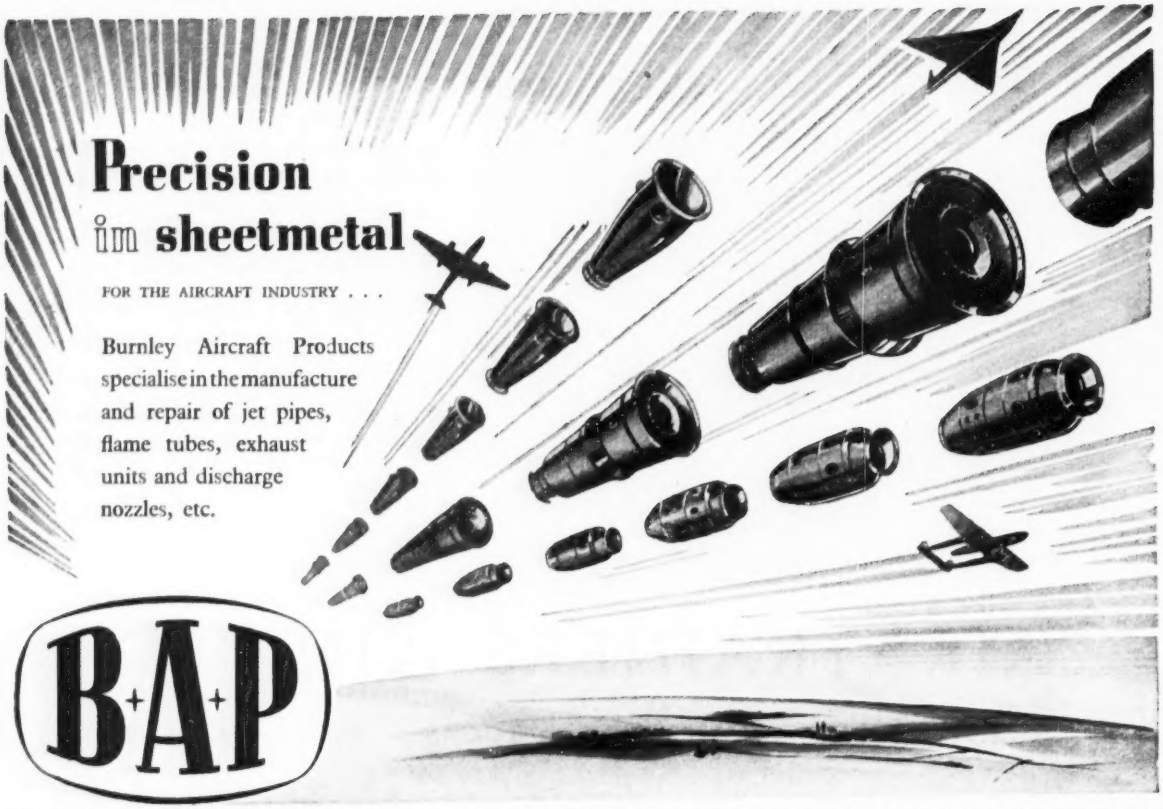
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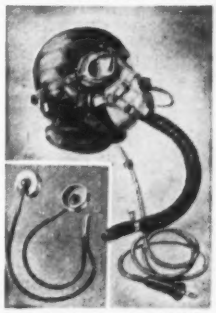

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This application will be considered by the Council under the Terms of Reference issued to them by the Minister of Civil Aviation on July 30, 1952. Any representations or objections with regard to this application must be made in writing stating the reasons, and must reach the Council within 14 days of the date of this advertisement, addressed to the Secretary, Air Transport Advisory Council, 9 Buckingham Gate, London S.W.1, from whom further details of the application may be obtained. When an objection is made to an application by another air transport company on the grounds that they are applying to operate the route or part of route in question, their application, if not already submitted to the Council, must reach them within the period allowed for the making of representations or objections. [9755

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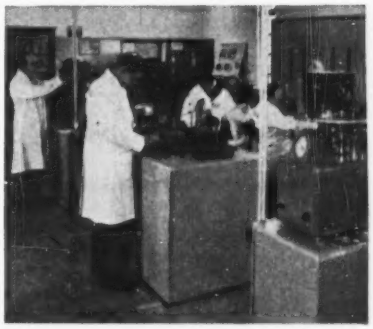

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# INDEX TO ADVERTISERS


| | Page |
|---|---|
| Aerocontacts, Ltd. | 36 |
| Air Trainers, Ltd. | 33 |
| Armstrong Siddeley Motors, Ltd. | 17 |
| Armstrong Whitworth Aircraft, Ltd., Sir W. G. | 25 |
| Aston and Co., Ltd. | 39 |
| Aviation Developments, Ltd. | 30 |
| Aviation Servicing, Ltd. | 37 |
| Boulton Paul Aircraft, Ltd. | 4 |
| British Air Line Pilots' Association, The | 35 |
| British Institute of Engineering Technology | 34 |
| British Messier, Ltd. | 16 |
| Bristol Aeroplane Co., Ltd., The | Cover iv |
| Burnley Aircraft Products Ltd. | 34 |
| Cellon, Ltd. | 6 |
| Components and Spares (Aircraft) Ltd. | 35 |
| Cross Manufacturing Co. (1938), Ltd. | 34 |
| De Havilland Aircraft Co., Ltd., The | 18, 38 |
| Desoutter Bros., Ltd. | 20 |
| Detuners, Ltd. | 23 |
| Dowty Equipment, Ltd. | Cover i |
| E.M.I. Institutes | 32 |
| Export Packing Service, Ltd. | 34 |
| Fairey Aviation Co., Ltd., The | 11 |
| Field Aircraft Services, Ltd. | 22, 37 |
| Fishers | 34 |
| Flight Refuelling, Ltd | 27 |
| Henlys, Ltd. | 38 |
| High Duty Alloys, Ltd. | Cover iii |
| Hobson, Ltd., H. M. | 7 |
| Iliffe & Sons Ltd. | 31, 34 |
| I.V. Pressure Controllers, Ltd. | 30 |
| Lewis, Ltd., D. | 35 |
| Martin-Baker Aircraft, Ltd. | 19 |
| Moulded Components (Jablo), Ltd. | 34 |
| Napier and Son, Ltd., D. | 13 |
| National Institute of Engineering | 39 |
| Petbow, Ltd. | 28 |
| Plessey Co., Ltd., The | 26 |
| Powis and Sons, Ltd., David | 30 |
| Pyrene Co., Ltd., The | 29 |
| Redifon, Ltd. | 14 |
| Reed, Ltd., Austin | 27 |
| Reynolds Tube Co., Ltd. | 32 |
| Roe and Co., Ltd., A. V. | 10 |
| Rolls-Royce, Ltd. | 15 |
| Rollason, Ltd., W. A. | 35 |
| Rotax, Ltd. | 12 |
| Scintilla, Ltd. | 27 |
| Short Brothers and Harland, Ltd. | 8, 38, 39 |
| Shell-Mex and B.P., Ltd. | 24 |
| Slingsby Sailplanes, Ltd. | 32 |
| Smiths Aircraft Instruments, Ltd. | 21 |
| Société Nationale de Constructions Aéronautiques du Sud-Ouest | 28 |
| Sperry Gyroscope Co., Ltd. | 1 |
| Staravia | 35 |
| Sugg and Co., Ltd., William | 32 |
| Teddington Controls, Ltd. | 29 |
| Teleflex Products, Ltd. | 5 |
| Thermionic Products, Ltd. | 31 |
| United Aircraft Export Corporation | 2, 3 |
| Vandervell Products, Ltd. | 9 |
| Vickers-Armstrongs, Ltd. | 33 |
| Westland Aircraft, Ltd. | Cover ii |
| Western Manufacturing (Reading), Ltd. | 33 |


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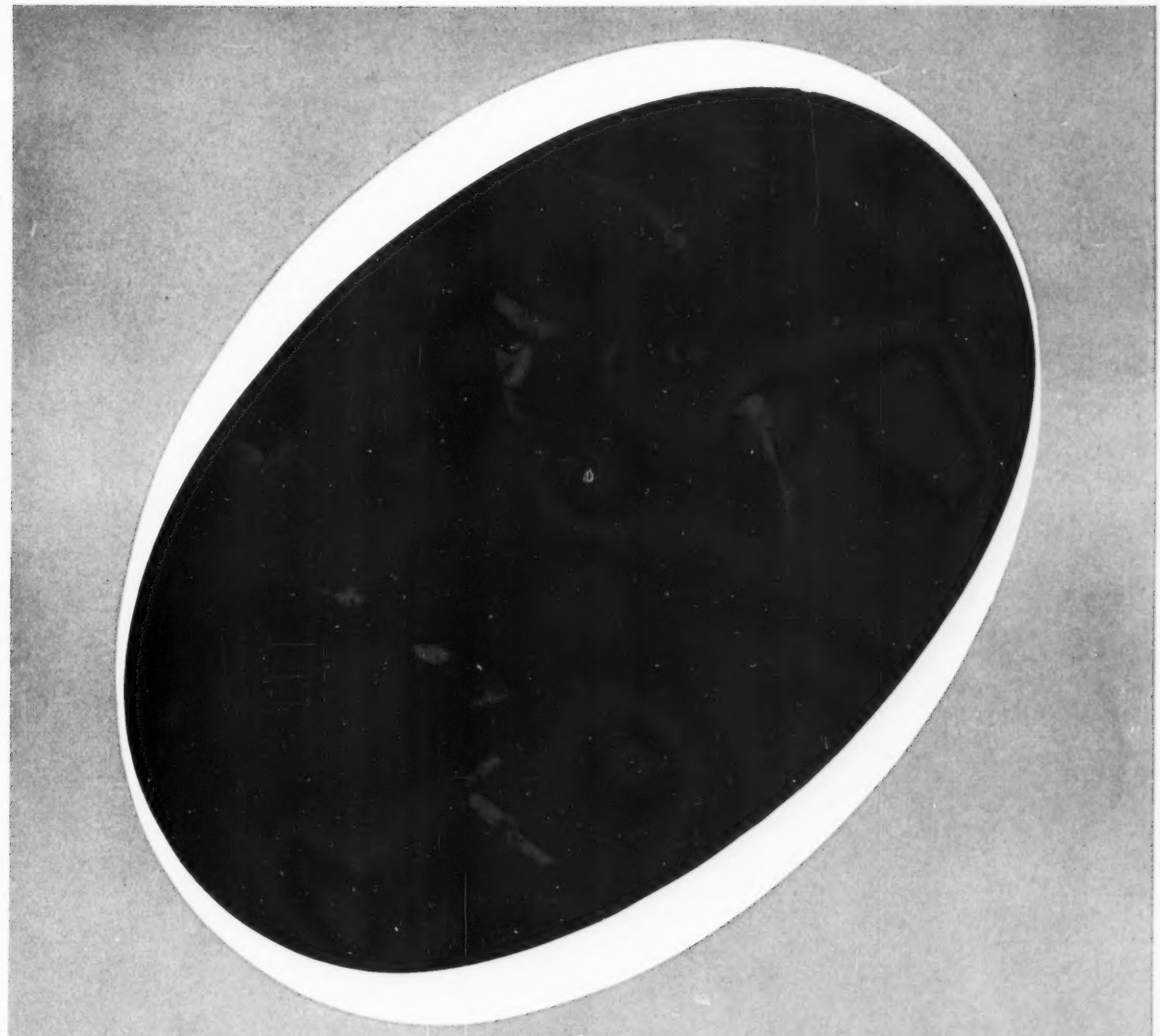

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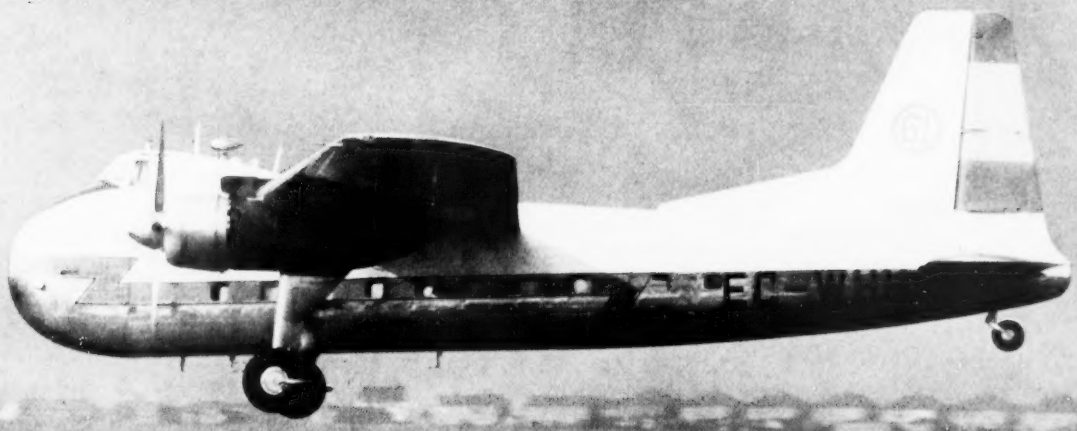

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